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TECHNICAL SUPPORT FOR
ROCKY MOUNTAIN ARSENAL

FINAL
HUMAN HEALTH EXPOSURE ASSESSMENT
FOR ROCKY MOUNTAIN ARSENAL
STUDY AREA EVALUATIONS
VOLUME VI-D
NORTH CENTRAL STUDY AREA
EXPOSURE ASSESSMENT
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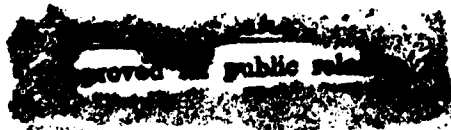
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LIST OF ACRONYMS

CAR	Contamination Assessment Report
COC	contaminant of concern
COS	contaminant of significance
CRL	certified reporting limit
d	depth to the top of the contamination zone
EI	exposure index
h	depth to the bottom of the contamination zone
ICP	Inductively Coupled Plasma
ISCLT	Industrial Source Complex Long Term Plume Dispersion
MKE	Morrison-Knudsen Engineers
NCSA	North Central Study Area
PPDDE	2,2-bis(Para-chlorophenyl)-1,1-dichloroethene
PPDDT	2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane
PPLV	preliminary pollutant limit value
RI	remedial investigation
RMA	Rocky Mountain Arsenal
RMACCPMT	Rocky Mountain Arsenal Contamination Control Program Management Team
SAR	Study Area Report
SPPPLV	single pathway preliminary pollutant limit value
VEI	vapor exposure index

EXECUTIVE SUMMARY

The North Central Study Area (NCSA) Exposure Assessment presents detailed exposure analyses for the 43 potentially contaminated areas defined by the North Central Study Area Report (SAR). The evaluations were based on the soil and sediment contaminant concentrations presented in the site-specific Contamination Assessment Reports (CARs) and the overall SARs and groundwater contaminants from DP Associates Groundwater Database. The maximum concentrations for each contaminant detected were extracted from these data and reported. Draft preliminary pollutant limit values (PPLVs) were computed for each of these site-specific contaminants as described in Volume IV of the Exposure Assessment Report for the direct (soil ingestion, suspended particulate inhalation, and dermal contact) and indirect (open and enclosed space vapor inhalation) exposure pathways. Cumulative PPLVs were computed for the five exposed populations (regulated visitors, casual visitors, recreational visitors, commercial workers, and industrial workers). The site-by-site evaluations consisted of comparisons of the maximum site contaminant concentrations to their corresponding cumulative Draft PPLVs in order to determine exceedances and, hence, established a first screen for determining sites which may be considered as candidates for remedial action during the Feasibility Study. These are ranked into two categories: Priority 1 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations exceed the draft human health based criteria, and Priority 2 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations do not exceed the draft human health based criteria. Site designations will be reconsidered throughout the Endangerment Assessment process as health based criteria are refined and additional data become available.

No samples from the interior of sewer lines present in the NCSA were included in the analysis since these evaluations are based on soil contaminants only. Sewers are being considered for remedial action under the ongoing Feasibility Study.

A groundwater plume has been identified in the NCSA. Therefore, in addition to the direct soil exposure evaluations, the significance of the inhalation of volatile groundwater contaminants which diffuse through site soils was estimated using the open space and enclosed space vapor inhalation models as described in detail in Volume IV (Sections 4.5 and 4.6, respectively) and the exposure analysis procedures presented in Volume VI-A. The exposure evaluations were performed for the most sensitive exposed population (i.e., the industrial worker).

Of the 43 sites evaluated in the NCSA, 30 were designated Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include:

- Basin A (NCSA-1a)
- Lime Settling Basins (NCSA-1b)
- Drainage Ditch (NCSA-1c)
- Liquid Storage Pool (NCSA-1d)
- Burn Site (NCSA-1e)
- South Plants Drainage Ditches (NCSA-1f)
- Basin C (NCSA-2a)
- Basin D (NCSA-2b)
- Basin E (NCSA-2c)
- Drainage Ditches (NCSA-2d)
- Basin F (NCSA-3)
- Deep Disposal Well (NCSA-4a)
- Basin F Exterior (NCSA-4b)
- Basin B (NCSA-5a)
- Drainage Ditches (NCSA-5b)
- Sand Creek Lateral (NCSA-5c)
- Surface Drainage Canal (NCSA-5d)
- Chemical Sewers from South Plants (NCSA-6a)
- Chemical Sewers from North Plants (NCSA-6b)
- North Bog (NCSA-7)

xxx

- Sanitary Sewer Lines (NCSA-8a)
- Domestic Sewage Treatment Plant (NCSA-8b)
- Section 34 - Mercury Detection (NCSA-8c)
- Section 23 - Cadmium Detection (NCSA-9b)
- Section 23 - Cadmium Detection (NCSA-9c)
- Section 23 - Cadmium Detection (NCSA-9d)
- Section 26 - Cadmium Detection (NCSA-9h)
- Section 27 - Arsenic Detection (NCSA-9l)
- Section 35 - Arsenic Detection (NCSA-9o)
- Cadmium Detection (NCSA-9r)

Of the 43 sites evaluated in the NCSA, 13 were designated Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include:

- Inferred Surficial Contamination (NCSA-1g)
- Section 23 - Diisopropylmethyl Phosphonate Detection (NCSA-9a)
- Section 24 - Zinc Detection (NCSA-9e)
- Section 25 - Zinc and Copper Detections (NCSA-9f)
- Section 26 - Suspected Methylene Chloride Detection (NCSA-9g)
- Section 26 - Butoxyethanol Detection (NCSA-9i)
- Section 26 - Suspected Mercury Detection (NCSA-9j)
- Section 26 - Trichloropropene Detection (NCSA-9k)
- Zinc Detection in Bedrock (NCSA-9m)
- Section 35 - Trichloropropene Detection (NCSA-9n)
- Section 36 - Arsenic and Mercury Detections (NCSA-9p)
- Mercury Detection (NCSA-9q)
- Section 36 - Mercury Detection (NCSA-9s)

The contaminants of concern (COCs) in soils (i.e., those displaying cumulative exposure indices (EIs) greater than 0.1) for the NCSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are:

- Aldrin
- Benzene
- Bicycloheptadiene
- Chlordane
- Chloroacetic acid
- Chlorobenzene
- Chloroform
- Chlorophenylmethyl sulfide
- Chlorophenylmethyl sulfone
- Chlorophenylmethyl sulfoxide
- Dibromochloropropane
- 1,2-Dichloroethane
- Dicyclopentadiene
- 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene (PPDDE)
- 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane (PPDDT)
- Dieldrin
- Dimethyldisulfide
- Endrin
- Fluoroacetic acid
- Hexachlorocyclopentadiene
- Isodrin
- Methylene chloride
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethylene
- Trichloroethylene
- Toluene
- Arsenic
- Cadmium
- Chromium

- Lead
- Mercury

The contaminants of significance (COSs) in groundwater (i.e., those displaying vapor exposure indices (VEIs) greater than 1) for the NCSA are:

- Benzene
- Carbon tetrachloride
- Chlorobenzene
- Chloroform
- Dibromochloropropane
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- Dicyclopentadiene
- Methylene chloride
- Tetrachloroethylene
- Trichloroethylene

1.0 INTRODUCTION

The analyses and evaluations performed under the Rocky Mountain Arsenal (RMA) Exposure Assessment are documented in eight report volumes. These include Volume I, Surface Use and Exposed Population Evaluations; Volumes II and III, Toxicity Assessment; Volumes IV and V, Preliminary Pollutant Limit Value (PPLV) Methodology; Volume VI, Study Area Exposure Assessments; Volume VII, Summary Exposure Assessment; and Volume VIII, Response to Comments on the Draft Exposure Assessment.

Volume VI of the Exposure Assessment is a detailed presentation of the study area exposure analyses, consisting of site-by-site comparisons of measured maximum contaminant concentrations to their Draft PPLVs derived for an industrial worker (the most sensitive receptor). Volume VI consists of eight subvolumes, VI-A through VI-H. Subvolume D (this document) constitutes the Study Area Exposure Assessment for the North Central Study Area (NCSA). The remaining subvolumes are: VI-A, Introduction; VI-B, Western Study Area; VI-C, Southern Study Area; VI-E, Central Study Area; VI-F, Eastern Study Area; VI-G, South Plants Study Area; and VI-H, North Plants Study Area. A description of the contents, approach, specific procedures, and format in preparing the Study Area Exposure Assessment documents is presented in Volume VI-A.

The exposure assessment for the NCSA was performed on a site-by-site basis. The site designations are consistent with those used in the remedial investigation (RI) Study Area Report (SAR) for the NCSA (EBASCO, 1989a). The analytical data used for each site were based on the original Rocky Mountain Arsenal Contamination Control Program Management Team (RMACCPMT)/Phase I and II RI site Contamination Assessment Reports (CARs). Additional information on the history of these sites can be found in Section 3.2 of the SAR (EBASCO, 1989a). The SARs present a regional overview of the extent of contamination and migration characteristics throughout the Arsenal. An analogous regional overview of the exposure assessment for the NCSA is presented in the Study Area Exposure Summary, Section 3.0 of this report volume. This regional summary is integrated with the other study area exposure summaries in Volume VII to provide an Arsenal-wide perspective of the significance of the measured contamination.

The sites included in the NCSA Exposure Assessment are as follows:

- Site NCSA-1a: Basin A
- Site NCSA-1b: Lime Settling Basins
- Site NCSA-1c: Drainage Ditch
- Site NCSA-1d: Liquid Storage Pool
- Site NCSA-1e: Burn Site
- Site NCSA-1f: South Plants Drainage Ditches
- Site NCSA-1g: Inferred Surficial Contamination
- Site NCSA-2a: Basin C
- Site NCSA-2b: Basin D
- Site NCSA-2c: Basin E
- Site NCSA-2d: Drainage Ditches
- Site NCSA-3: Basin F
- Site NCSA-4a: Deep Disposal Well
- Site NCSA-4b: Basin F Exterior
- Site NCSA-5a: Basin B
- Site NCSA-5b: Drainage Ditches
- Site NCSA-5c: Sand Creek Lateral
- Site NCSA-5d: Surface Drainage Canal
- Site NCSA-6a: Chemical Sewers from South Plants
- Site NCSA-6b: Chemical Sewers from North Plants
- Site NCSA-7: North Bog
- Site NCSA-8a: Sanitary Sewer Lines
- Site NCSA-8b: Domestic Sewage Treatment Plant
- Site NCSA-8c: Section 34 - Mercury Detection
- Site NCSA-9a: Section 23 - Diisopropylmethyl Phosphonate Detection
- Site NCSA-9b: Section 23 - Cadmium Detection
- Site NCSA-9c: Section 23 - Cadmium Detection
- Site NCSA-9d: Section 23 - Cadmium Detection
- Site NCSA-9e: Section 24 - Zinc Detection

- Site NCSA-9f: Section 25 - Zinc and Copper Detections
- Site NCSA-9g: Section 26 - Suspected Methylene Chloride Detection
- Site NCSA-9h: Section 26 - Cadmium Detection
- Site NCSA-9i: Section 26 - Butoxyethanol Detection
- Site NCSA-9j: Section 26 - Mercury Detection
- Site NCSA-9k: Section 26 - Trichloropropene Detection
- Site NCSA-9l: Section 27 - Arsenic Detection
- Site NCSA-9m: Zinc Detection in Bedrock
- Site NCSA-9n: Section 35 - Trichloropropene Detection
- Site NCSA-9o: Section 35 - Arsenic Detection
- Site NCSA-9p: Section 36 - Arsenic and Mercury Detections
- Site NCSA-9q: Mercury Detection
- Site NCSA-9r: Cadmium Detection
- Site NCSA-9s: Section 36 - Mercury Detection

The locations of each of the sites listed above in the NCSA were depicted in the North Central SAR (EBASCO, 1989a). The site-by-site exposure assessments for each of the 43 areas investigated are presented in Sections 2.1 through 2.43. A study area exposure summary for the NCSA is presented in Section 3.0.

The Soil Contaminant Concentration Tables in Sections 2.1 through 2.43, list the maximum concentrations that were calculated for each site over two depth intervals, designated as Horizon 1 and Horizon 2. Horizon 1 included depths from 0 to 10 feet (ft), and Horizon 2 accounted for all depths, including 0 to 10 ft. If the maximum concentration for all depths is in Horizon 1, then the listed concentration in Horizon 2 will equal Horizon 1. For a further discussion, see Volume VI-A, Section 2.2.4. The Inductively Coupled Plasma (ICP) metals (i.e., cadmium, chromium, copper, lead, and zinc), arsenic, and mercury identified as site contaminants in the tables include only those which were detected above indicator levels. The following are the indicator levels used:

<u>Contaminant</u>	<u>Indicator Level</u>
Arsenic	CRL ^{1/} -10 ug/g ^{2/}
Cadmium	1-2 ug/g
Chromium	25-40 ug/g
Copper	20-35 ug/g
Lead	25-40 ug/g
Mercury	CRL-0.10 ug/g
Zinc	60-80 ug/g

As described in Volume VI-A of this report, nontarget contaminants were subjected to two screening processes to determine whether or not they should be evaluated in detail in the site-by-site exposure assessments. The first screening was conducted as part of the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01), and was based on the toxicity, concentration, and frequency of occurrence of the nontarget compounds. Contaminants passing through this first screening were then subjected to a second screening that was conducted on a study area-by-study area basis within Appendix A of each Study Area Exposure Assessment (Volumes VI-B through VI-H). This second screening process considered frequency of occurrence, similarity of the nontarget concentration to that of target contaminants, and co-occurrence of nontarget compounds with target compounds in the soil and sediment samples. The reader is encouraged to consult the RMA Chemical Index and the Study Area Exposure Assessment Appendices for details of the screening processes, as it was judged too repetitive to include this information in each site where nontargets were detected.

Draft PPLVs for each of the site contaminants were computed for the five exposed populations of concern which are regulated visitors, casual visitors, recreational visitors, commercial workers, and industrial workers for the direct (i.e., soil ingestion, dermal contact, and suspended particulate inhalation) and indirect (i.e., open and enclosed space vapor inhalation) exposure pathways, according to the methodology detailed in Volume IV of the Exposure Assessment. Draft PPLVs for each site are presented in the Exposure

1/ certified reporting limit
2/ micrograms per gram

Evaluation Tables. Figure NCSA-1-0 explains various aspects of the data presented in the Exposure Evaluation Tables. For a further discussion of these tables, see Section 3.0 in Volume VI-A.

The cumulative Draft PPLVs in these tables for ICP metals, arsenic, and mercury do not include the single pathway preliminary pollutant limit values (SPPPLVs) computed for vapor inhalation exposure pathways since the potential for inhalation of vaporized ICP metals, arsenic, and mercury is assumed to be negligible (see Volume VI-A). SPPPLVs for the inhalation pathways are not included in the cumulative Draft PPLVs for chloroacetic acid, 1,2-dichloroethylene, dimethylmethyl phosphonate, Dithiane, fluoroacetic acid, isopropylmethyl phosphate, isopropylmethyl phosphonic acid, n-nitrosodimethylamine, 1,4-Oxathiane, Sarin, and thiodiglycol. These chemicals are highly soluble (log Kow less than one) and, therefore, are assumed to have low potential for vaporization.

The chemical-specific and site-specific parameters used to calculate the open and enclosed space vapor inhalation PPLVs are included in the RMA Source Data File, provided as part of the PPLV Computer Model for RMA (Volume V). Contaminant-specific parameters for the open space pathways are the depth to the top of the contamination zone (d), and the depth to the bottom of the contamination zone (h), diffusivity and soil concentration. These variables are calculated as described in Volume IV. The site-specific parameter, X/F_o , represents the wind dispersion factor at the receptor location receiving the maximum concentration. This parameter was generated by the Industrial Source Complex Long Term (ISCLT) model as described in Volume IV. The distance from the center of the site to the critical receptor location, D_{max} , used with the computation of X/F_o , was calculated as described in Volume IV.

Site-by-site comparisons of the maximum site contaminant concentrations to their corresponding cumulative Draft PPLVs were done in order to determine sites which may be considered for remedial action during the Feasibility Study. These are ranked into two categories: Priority 1 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations exceed the draft

Figure NCSA-1-0
Sample Exposure Summary Table

1	2	3	4	5	6	7	8	9	10
Contaminant	Direct PPLV	OSVI ^{3/}	Indirect PPLV ^{1/} ESVI ^{4/}	Cumulative PPLV	Direct EI ^{5/}	Indirect EI	Cumulative EI	OPN ^{6/}	VEI ^{2/} ENC ^{7/}
Aldrin	1.16E-01	1.17E+04	4.20E+01	1.16E-01	6.87E+02*	1.91E+00*	6.89E+02*	2.23E-06	1.68E-03
Carbon Tetrachloride	1.52E+01	0.00E+00	0.00E+00	1.52E+01	0.00E+00	0.00E+00	0.00E+00	6.07E-04	4.58E-01
Chlordane	1.52E+00	1.26E+06	5.17E+00	1.17E+00	5.27E+02*	1.55E+02*	6.81E+02*	0.00E+00	0.00E+00
Chloroform	3.11E+02	0.00E+00	0.00E+00	3.11E+02	0.00E+00	0.00E+00	0.00E+00	1.26E-05	1.02E-02
PPDDE	5.72E+00	7.07E+05	1.95E+01	4.42E+00	1.43E-02	4.21E-03	1.85E-02	1.34E-07	1.02E-04
PPDDT	5.72E+00	1.49E+06	1.95E+01	4.42E+00	1.75E+00*	5.14E-01*	2.26E+00*	0.00E+00	0.00E+00
Dieldrin	1.22E-01	5.35E+03	1.92E+01	1.22E-01	2.45E+04*	1.57E+02*	2.47E+04*	0.00E+00	0.00E+00
Diisopropylmethyl Phosphonate	6.77E+04	0.00E+00	0.00E+00	6.77E+04	0.00E+00	0.00E+00	0.00E+00	3.13E-10	2.37E-07
Endrin	2.54E+02	4.33E+06	1.00E+06	2.50E+02	7.88E-02	1.29E-03 ^a	8.91E-02	0.00E+00	0.00E+00
Hexachlorocyclopentadiene	3.84E+02	5.96E+01	8.34E-01	8.20E-01	7.81E+00*	3.65E+03*	3.66E+03*	0.00E+00	0.00E+00
Isodrin	5.92E+01	8.47E+05	3.04E+03	5.81E+01	8.45E+00*	1.65E-01*	8.61E+00*	0.00E+00	0.00E+00
Supona	1.27E+02	0.00E+00	0.00E+00	1.27E+02	0.0E+00	0.00E+00	0.00E+00	1.39E-12	1.05E-09
Arsenic	1.61E+00	0.00E+00	0.00E+00	1.61E+00	1.30E+01*	0.00E+00	1.30E+01*	0.00E+00	0.00E+00
Copper	5.71E+02	0.00E+00	0.00E+00	5.71E+04	6.83E-04	0.00E+00	6.83E-04	0.00E+00	0.00E+00
Mercury	4.61E+02	0.00E+00	0.00E+00	4.61E+02	2.38E-03	0.00E+00	2.38E-03	0.00E+00	0.00E+00
Zinc	1.39E+05	0.00E+00	0.00E+00	1.39E+05	7.17E-04	0.00E+00	7.17E-04	0.00E+00	0.00E+00

^a This contaminant saturates the soil gas and produces a vapor flux that is below one-tenth of the critical flux. The SPPLV^{4/} for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

A direct PPLV will be computed even if contaminant does not occur in the soil but only in the groundwater.

Indirect PPLVs are not computed for the nonvolatile contaminants (metals).

Contaminants with a Direct EI > 0.1 are denoted with an asterisk.

Contaminants with an Indirect EI > 0.1 are denoted with an asterisk.

A contaminant which saturates the soil gas will not show a VEI.

A contaminant which saturates the soil gas but does not have an Indirect EI exceedance will be denoted with the footnote marker "a." The indirect PPLVs (OSVI, ESVI) are set to 1.00E+06 (pure compound).

Contaminants which occur in the groundwater, but also occur in the soil may not have a computed VEI if the contamination saturates the soil gas.

VEIs are not computed for metals or organics if the contaminant does not occur in the groundwater.

An enclosed space VEI may not be computed if the reported depth to groundwater is less than 10 ft. In such cases, the enclosed space VEI will have "NA" for not applicable. No enclosed space VEI will be computed for lake sites. For lake sites, the enclosed space VEI will have "LS" for lake site.

- 1/ PPLV - preliminary pollutant limit value
- 2/ VEI - vapor exposure index
- 3/ OSVI - open space vapor inhalation PPLV
- 4/ ESVI - enclosed space vapor inhalation PPLV
- 5/ EI - exposure index
- 6/ OPN - open
- 7/ ENC - enclosed
- 8/ SPPLV - single pathway preliminary pollutant limit value

ORGANICS

Only contaminants found in either the soil or the groundwater are listed.

METALS

human health based criteria, and Priority 2 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations do not exceed the draft human health based criteria. Site designations will be reconsidered throughout the Endangerment Assessment process as health based criteria are refined and additional data become available.

2.0 SITE-BY-SITE EXPOSURE ASSESSMENT

2.1 SITE NCSA-1a: BASIN A (formerly Site 36-1: Basin A; ESE, 1987a/RIC 87203R07 and ESE, 1988a/RIC 87203R07A)

2.1.1 Site-Specific Considerations

Figure NCSA-1a-1 and Tables NCSA-1a-1 and NCSA-1a-2 depict the target contaminants for site NCSA-1a. Borings 3041, 3042, 3199 through 3201, 3203 through 3205, 3207, 3208, 3210 through 3212, 3216 through 3229, 3231, 3232, 3234 through 3257, 3259, 3312, 3331, 3342 through 3346, 3348 through 3352, 3493 through 3499, 3500/3733, 3501 through 3503, 3504/3734, 3505 through 3515, 3516/3735, 3517 through 3529, 3530/3736, 3531, 3532, 3533/3737, 3534 through 3538, 3540 through 3551, 3553 through 3559, 3626, and 3646 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-1a (ESE, 1987a/RIC 87203R07).

2.1.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1a are shown in Figure NCSA-1a-1. The following contaminants were not included in the figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Methyl cyclohexane, occurring in Borings 3503 (7-8 ft); methylphosphonic acid, occurring in Boring 3546 (4-5 ft); hexachlorobutadiene, occurring in Boring 3503 (7-8 ft); oxybisethanol, occurring in Borings 3205 (7-8 ft), 3207 (0-1, 4-5 and 8-9 ft), 3211 (0-1 and 3-4 ft), 3216 (0-1 ft), 3221 (0-1 ft), 3223 (0-1 ft), 3229 (0-1 and 4-5 ft), 3240 (0-1 ft), 3241 (0-1 ft), 3245 (0-1 ft), 3246 (0-1 and 4-5 ft), 3249 (0-1 ft), and 3250 (0-1 and 4-5 ft); phosphoric acid, triphenyl ester, occurring in Borings 3199 (0-1, 4-5, and 9-10 ft), 3200 (4-5 ft), 3201 (0-1 and 4-5 ft), 3207 (4-5 ft), 3242 (4-5 ft), 3243 (0-1 ft), 3248 (0-1 ft), and 3256 (0-1 and 3-4 ft); and tetrachlorobenzene, occurring in Boring 3350 (0-1 ft). Although not shown on this figure, these nontargets were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-1a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and certified reporting limits (CRLs) for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1a-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.1.3 Site Exposure Summary

Tables NCSA-1a-3 through NCSA-1a-7 present Draft PPLVs, EIs, and VELs for each site contaminant. Since the depth to groundwater below Site NCSA-1a is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Chlordane	Direct	Direct	Direct	Direct	Direct
PPDDE	Direct	Direct	Direct	Direct	Direct
PPDDT	Direct	Direct	Direct	Direct	Direct
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Fluoroacetic acid	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
Cadmium	--	--	Direct	--	Direct
Isodrin	--	--	Direct	Direct	Direct
Chromium	Direct	Direct	Direct	Direct	Direct
Benzene	--	--	--	Indirect	Indirect
Dicyclopentadiene	--	--	--	Indirect	Indirect
Hexachlorocyclopentadiene	--	--	--	Indirect	Dir/Ind
Methylene chloride	--	--	--	Indirect	Indirect
Tetrachloroethylene	--	--	--	Indirect	Indirect
Trichloroethylene	--	--	--	Indirect	Indirect
Mercury	--	--	Direct	Direct	Direct

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Chlorobenzene	--	--	--	--	Indirect
Endrin	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-1a is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Trichloroethylene (enclosed)
- Methylene chloride (enclosed)
- Dicyclopentadiene (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Chloroform (enclosed)
- Chlorobenzene (enclosed)
- Benzene (enclosed)
- Carbon tetrachloride (enclosed)

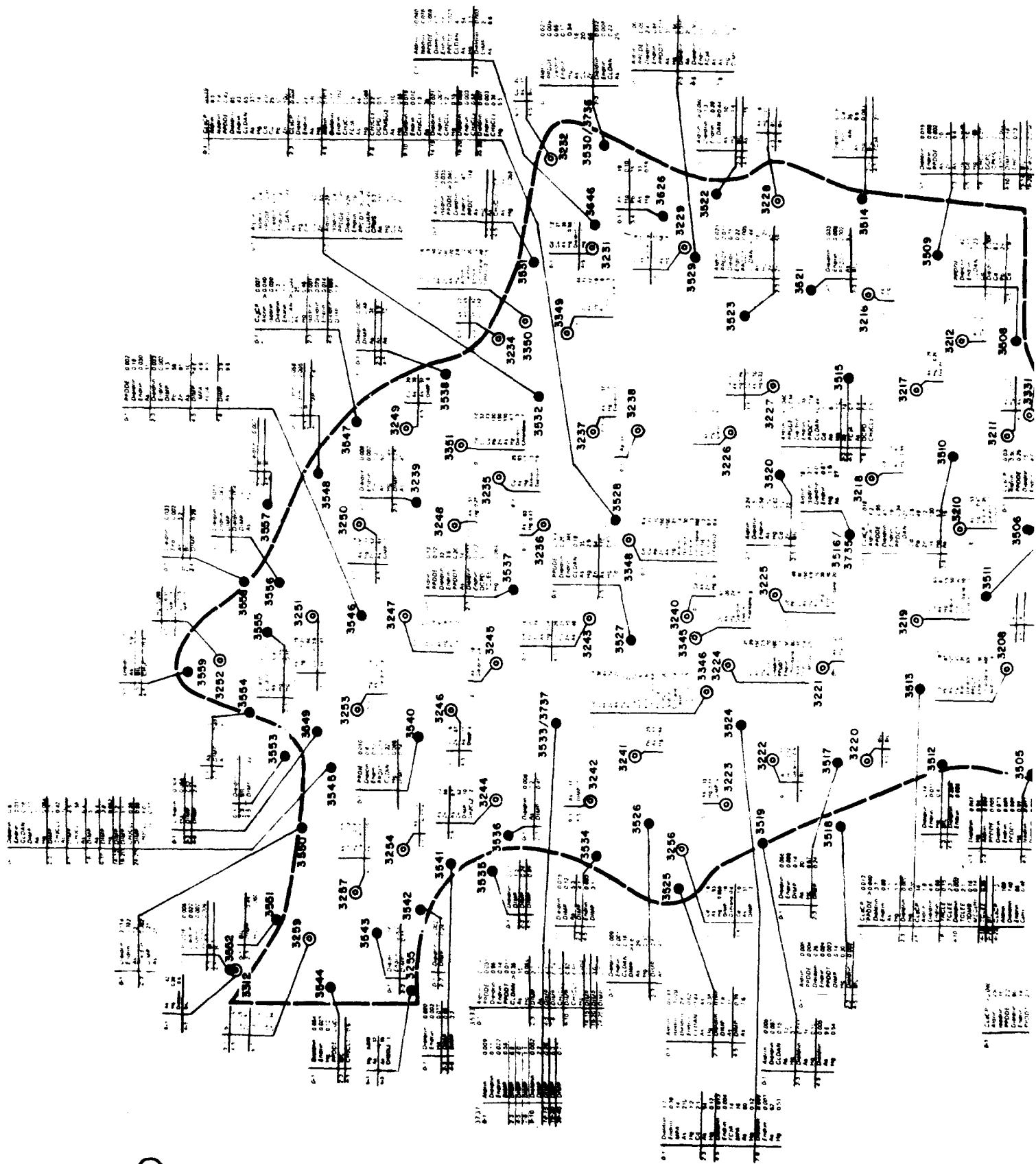


TABLE NCSA-1a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	400	0-1	3343	400	0-1	3343
Benzene	1.6	7-8	3503	1.6	7-8	3503
Chlordane	400	0-1	3208	400	0-1	3208
		0-1	3346		0-1	3346
Chlorobenzene	4.4	7-8	3503	4.4	7-8	3503
Chloroform	0.27	7-8	3509	0.27	7-8	3509
Chlorophenylmethyl sulfide	5.3	1-2	3532	5.3	1-2	3532
Chlorophenylmethyl sulfone	2	0-1	3343	2	0-1	3343
		0-1	3342		0-1	3342
Chlorophenylmethyl sulfoxide	6	0-1	3204	6	0-1	3204
PPDDE	10	0-1	3346	10	0-1	3346
PPDDT	60	0-1	3346	60	0-1	3346
Dibromochloropropane	0.007	0-1	3201	0.007	0-1	3201
Dicyclopentadiene	3	2-3	3537	3	2-3	3537
Dieldrin	700	0-1	3346	700	0-1	3346
Diisopropylmethyl phosphonate	10	0-1	3256	10	0-1	3256
		5-6	3244		5-6	3244
Dithiane	0.80	0-1	3346	0.80	0-1	3346
Endrin	90	0-1	3208	90	0-1	3208
Ethylbenzene	7.2	2-3	3503	7.2	2-3	3503
Fluoroacetic acid	21	4-5	3514	21	4-5	3514
Hexachlorobutadiene ¹¹	9.0	7-8	3503	9.0	7-8	3503
Hexachlorocyclopentadiene	100	0-1	3346	100	0-1	3346
Isodrin	49	0-1	3500/3733	49	0-1	3500/3733
Isopropylmethyl phosphonic acid	4.9	4-5	3546	4.9	4-5	3546
Methyl cyclohexane ¹¹	30	7-8	3503	30	7-8	3503

TABLE NCSA-1a-1 (Continued)
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Methylene chloride	2	5-6	3244	2	5-6	3244
Methyl phosphonic acid ^{1/}	35	4-5	3546	35	4-5	3546
Oxybisethanol ^{1/}	8.0	3-4	3211	8.0	3-4	3211
Phosphoric acid, triphenyl ester ^{1/}	20	0-1	3243	20	0-1	3243
		0-1	3256		0-1	3256
Tetrachlorobenzene ^{1/}	1.0	0-1	3350	1.0	0-1	3350
Tetrachloroethylene	3.3	2-3	3503	3.3	2-3	3503
Toluene	0.89	7-8	3503	0.89	7-8	3503
Trichloroethylene	1.1	7-8	3503	1.1	7-8	3503
m-Xylene	13	2-3	3503	13	2-3	3503
o,p-Xylene	13	2-3	3503	13	2-3	3503
Arsenic	1100	0-1	3348	--	--	--
Cadmium	8.2	2-3	3508	--	--	--
Chromium	100	0-1	3243	--	--	--
Copper	210	0-1	3342	--	--	--
Lead	120	0-1	3351	--	--	--
Mercury	250	2-3	3503	--	--	--
Zinc	190	0-1	3351	--	--	--

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-1a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1a

AVERAGE SITE DEPTH TO GROUNDWATER: 20 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	88	36076	02/8/88
1,1,2-TRICHLOROETHANE	98	36168	01/5/89
1,1-DICHLOROETHYLENE	2.0	36076	02/8/88
1,1-DICHLOROETHANE	74	36168	01/5/89
1,2-DICHLOROETHYLENE	90	36168	01/5/89
1,2-DICHLOROETHANE	50	36019	02/9/88
M-XYLENE	3.9	36177	10/28/87
ALDRIN	5.9	36177	05/10/88
ATRAZINE	34	36076	01/6/89
BICYCLOHEPTADIENE	2.7	36082	02/9/88
BENZOTHIAZOLE	26	36177	10/28/87
BENZENE	12000	36076	01/6/89
CARBON TETRACHLORIDE	12	36177	10/28/87
METHYLENE CHLORIDE	33000	36076	01/6/89
CHLOROFORM	3900000	36168	05/11/88
HEXACHLOROCYCLOPENTADIENE	1.2	36168	01/5/89
CHLOROBENZENE	26000	36076	02/8/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

TABLE NCSA-1a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1a

AVERAGE SITE DEPTH TO GROUNDWATER: 20 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLORDANE	11	36177	01/6/89
CHLOROPHENYLMETHYL SULFIDE	30	36177	10/28/87
CHLOROPHENYLMETHYL SULFOXIDE	50	36168	01/5/89
CHLOROPHENYLMETHYL SULFONE	1300	36076	01/6/89
DIBROMOCHLOROPROPANE	30	36168	05/11/88
DICYCLOPENTADIENE	67	36168	01/5/89
VAPONA	190	36168	01/5/89
DIISOPROPYLMETHYL PHOSPHONATE	9100	36177	10/28/87
DITHIANE	5500	36177	01/6/89
DIELDRIN	1.2	36177	01/6/89
DIMETHYL DISULFIDE	14	36168	05/11/88
DIMETHYLMETHYL PHOSPHONATE	24	36177	01/6/89
ENDRIN	0.33	36084	01/6/89
ETHYLBENZENE	9.2	36177	10/28/87
ISODRIN	3.2	36084	01/6/89
TOLUENE	120	36168	01/5/89
METHYLISOBUTYL KETONE	4100	36168	05/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1a
AVERAGE SITE DEPTH TO GROUNDWATER: 20 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
MALATHION	89	36177	01/6/89
1,4-OXATHIANE	420	36081	02/9/88
PPDDE	0.75	36084	01/6/89
PPDDT	1.1	36177	01/6/89
PARATHION	4.1	36076	01/6/89
SUPONA	2.9	36076	01/6/89
TETRACHLOROETHYLENE	77	36168	01/5/89
TRICHLOROETHYLENE	2100	36168	01/5/89
O,P-XYLENE	24	36177	10/28/87

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	2.7E+02*	2.0E-05a	2.7E+02*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-15
BENZENE	8.6E+02	1.5E+05	8.6E+02	1.9E-03	1.1E-05	1.9E-03	1.5E-04
BENZOTHIADIAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-10
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-10
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-06
CHLORDANE	2.0E+01	1.0E+06	2.0E+01	2.0E+01*	1.9E-07a	2.0E+01*	0.0E+00
CHLOROBENZENE	1.6E+05	9.5E+06	1.6E+05	2.7E-05	4.6E-07	2.8E-05	2.9E-06
CHLOROFORM	4.0E+03	2.2E+06	4.0E+03	6.7E-05	1.2E-07	6.7E-05	7.5E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	1.8E+08	1.6E+05	3.2E-05	2.9E-08	3.2E-05	1.3E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	3.2E+08	1.6E+05	1.2E-05	6.2E-09	1.2E-05	7.0E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	3.6E+08	1.6E+05	3.7E-05	1.7E-08	3.7E-05	5.1E-12
PPDDE	7.4E+01	1.2E+09	7.4E+01	1.4E-01*	8.3E-09	1.4E-01*	7.4E-10
PPDDT	7.4E+01	1.0E+06	7.4E+01	8.2E-01*	2.4E-08a	8.2E-01*	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	1.3E+04	1.8E+01	3.9E-04	5.6E-07	3.9E-04	8.0E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-07
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	5.7E-06
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	3.2E+05	4.6E+04	5.5E-05	9.5E-06	5.5E-05	2.6E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.4E+02*	7.7E-05a	4.4E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	7.7E+07	6.6E+05	1.5E-05	1.3E-07	1.5E-05	2.7E-09
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	9.7E-06	0.0E+00	9.7E-06	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-02	1.2E-08a	3.6E-02	0.0E+00
ETHYLBENZENE	8.3E+05	2.5E+08	8.2E+05	8.7E-06	2.9E-08	8.7E-06	8.2E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	5.4E-01*	0.0E+00	5.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	1.0E+06	1.7E+04	6.0E-03	1.3E-05a	6.0E-03	0.0E+00
ISODRIN	5.8E+02	1.0E+06	5.8E+02	8.5E-02	3.4E-08a	8.5E-02	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	2.0E-06	0.0E+00	2.0E-06	0.0E+00
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	5.2E-14
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-09
METHYLENE CHLORIDE	3.3E+03	3.2E+05	3.2E+03	6.1E-04	6.3E-06	6.2E-04	8.5E-05
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-15
TETRACHLOROETHYLENE	5.1E+02	2.0E+06	5.1E+02	6.4E-03	1.6E-06	6.5E-03	4.5E-07
TOLUENE	2.5E+06	1.1E+09	2.5E+06	3.6E-07	8.2E-10	3.6E-07	2.4E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	6.9E-10
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	5.0E-07
TRICHLOROETHYLENE	2.3E+03	9.4E+05	2.3E+03	4.8E-04	1.2E-06	4.8E-04	2.4E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-10
M-XYLENE	1.4E+07	1.5E+09	1.4E+07	9.1E-07	8.9E-09	9.2E-07	4.8E-11
O,P-XYLENE	1.4E+07	1.5E+09	1.4E+07	9.1E-07	8.9E-09	9.2E-07	2.9E-10

NCSA-1a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.1E+01*	0.0E+00	5.1E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.8E-02	0.0E+00	1.8E-02	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	1.4E+00*	0.0E+00	1.4E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	5.0E-04	0.0E+00	5.0E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	7.8E-03	0.0E+00	7.8E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	7.6E-02	0.0E+00	7.6E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.6E-05	0.0E+00	9.6E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	2.7E+02*	2.0E-05a	2.7E+02*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-15
BENZENE	8.6E+02	1.5E+05	8.6E+02	1.9E-03	1.1E-05	1.9E-03	1.5E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-10
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-10
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-06
CHLORDANE	2.0E+01	1.0E+06	2.0E+01	2.0E+01*	1.9E-07a	2.0E+01*	0.0E+00
CHLOROBENZENE	1.6E+05	9.5E+06	1.6E+05	2.7E-05	4.6E-07	2.8E-05	2.9E-06
CHLOROFORM	4.0E+03	2.2E+06	4.0E+03	6.7E-05	1.2E-07	6.7E-05	7.5E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	1.8E+08	1.6E+05	3.2E-05	2.9E-08	3.2E-05	1.3E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	3.2E+08	1.6E+05	1.2E-05	6.2E-09	1.2E-05	7.0E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	3.6E+08	1.6E+05	3.7E-05	1.7E-08	3.7E-05	5.1E-12
PPDDE	7.4E+01	1.2E+09	7.4E+01	1.4E-01*	8.3E-09	1.4E-01*	7.4E-10
PPDDT	7.4E+01	1.0E+06	7.4E+01	8.2E-01*	2.4E-08a	8.2E-01*	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	1.3E+04	1.8E+01	3.9E-04	5.6E-07	3.9E-04	8.0E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-07
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	5.7E-06
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	3.2E+05	4.6E+04	5.5E-05	9.5E-06	6.5E-05	2.6E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.4E+02*	7.7E-05a	4.4E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	7.7E+07	6.6E+05	1.5E-05	1.3E-07	1.5E-05	2.7E-09
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	9.7E-06	0.0E+00	9.7E-06	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-02	1.2E-08a	3.6E-02	0.0E+00
ETHYLBENZENE	8.3E+05	2.5E+08	8.2E+05	8.7E-06	2.9E-08	8.7E-06	8.2E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	5.4E-01*	0.0E+00	5.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	1.0E+06	1.7E+04	6.0E-03	1.3E-05a	6.0E-03	0.0E+00
ISODRIN	5.6E+02	1.0E+06	5.8E+02	8.5E-02	3.4E-08a	8.5E-02	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	2.0E-06	0.0E+00	2.0E-06	0.0E+00
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	5.2E-14
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-09
METHYLENE CHLORIDE	3.3E+03	3.2E+05	3.2E+03	6.1E-04	6.3E-06	6.2E-04	8.5E-05
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-15
TETRACHLOROETHYLENE	5.1E+02	2.0E+06	5.1E+02	6.4E-03	1.6E-06	6.5E-03	4.5E-07
TOLUENE	2.5E+06	1.1E+09	2.5E+06	3.6E-07	8.2E-10	3.6E-07	2.4E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	6.9E-10
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	5.0E-07
TRICHLOROETHYLENE	2.3E+03	9.4E+05	2.3E+03	4.8E-04	1.2E-06	4.8E-04	2.4E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-10
M-XYLENE	1.4E+07	1.5E+09	1.4E+07	9.1E-07	8.9E-09	9.2E-07	4.8E-11
O,P-XYLENE	1.4E+07	1.5E+09	1.4E+07	9.1E-07	8.9E-09	9.2E-07	2.9E-10

NCSA-1a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.1E+01*	0.0E+00	5.1E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.8E-02	0.0E+00	1.8E-02	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	1.4E+00*	0.0E+00	1.4E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	5.0E-04	0.0E+00	5.0E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	7.8E-03	0.0E+00	7.8E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	7.6E-02	0.0E+00	7.6E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.6E-05	0.0E+00	9.6E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.0E+06	2.1E-01	1.9E+03*	3.0E-04a	1.9E+03*	0.0E+00
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	9.5E-15
BENZENE	1.2E+02	2.3E+04	1.2E+02	1.3E-02	6.8E-05	1.3E-02	2.3E-03
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	9.2E-10
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-09
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	4.0E-05
CHLORDANE	2.7E+00	1.0E+06	2.7E+00	1.5E+02*	2.8E-06a	1.5E+02*	0.0E+00
CHLOROBENZENE	6.8E+04	3.4E+06	6.7E+04	6.4E-05	1.3E-06	6.6E-05	1.9E-05
CHLOROFORM	5.6E+02	3.5E+05	5.6E+02	4.8E-04	7.8E-07	4.8E-04	1.1E-01
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	6.5E+07	7.0E+04	7.6E-05	8.1E-08	7.6E-05	8.7E-10
CHLOROPHENYLMETHYL SULFONE	7.0E+04	5.0E+07	7.0E+04	2.9E-05	4.0E-08	2.9E-05	4.5E-10
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	1.3E+08	7.0E+04	8.6E-05	4.6E-08	8.6E-05	3.3E-11
PPDE	1.0E+01	8.0E+07	1.0E+01	9.8E-01*	1.3E-07	9.8E-01*	1.1E-08
PPDT	1.0E+01	1.0E+06	1.0E+01	5.9E+00*	3.6E-07a	5.9E+00*	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	1.9E+03	2.5E+00	2.8E-03	3.6E-06	2.8E-03	1.2E-05
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	3.9E-09
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-06
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	8.6E-05
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	1.1E+05	1.6E+04	1.6E-04	2.6E-05	1.9E-04	1.7E-05
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	3.2E+03*	1.2E-03a	3.2E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	5.2E+07	2.8E+05	3.6E-05	1.9E-07	3.6E-05	1.7E-08
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	2.3E-05	0.0E+00	2.3E-05	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	8.5E-02	7.9E-08a	8.5E-02	0.0E+00
ETHYLBENZENE	3.5E+05	9.1E+07	3.5E+05	2.0E-05	7.9E-08	2.1E-05	5.3E-10
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	1.3E+00*	0.0E+00	1.3E+00*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	1.0E+06	5.6E+03	1.8E-02	8.4E-05a	1.8E-02	0.0E+00
ISODRIN	2.5E+02	1.0E+06	2.5E+02	2.0E-01*	2.2E-07a	2.0E-01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.1E+06	0.0E+00	1.1E+06	4.6E-06	0.0E+00	4.6E-06	0.0E+00
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-13
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-08
METHYLENE CHLORIDE	4.5E+02	4.9E+04	4.5E+02	4.4E-03	4.1E-05	4.4E-03	1.3E-03
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-13
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	8.6E-15
TETRACHLOROETHYLENE	7.1E+01	3.1E+05	7.1E+01	4.6E-02	1.1E-05	4.6E-02	6.7E-06
TOLUENE	1.1E+06	3.9E+08	1.1E+06	8.4E-07	2.3E-09	8.4E-07	1.5E-09
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-09
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-06
TRICHLOROETHYLENE	3.2E+02	1.4E+05	3.2E+02	3.5E-03	7.6E-06	3.5E-03	3.6E-04
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-08
M-XYLENE	5.8E+06	5.9E+07	5.3E+06	2.2E-06	2.2E-07	2.5E-06	3.1E-10
O,P-XYLENE	5.8E+06	5.9E+07	5.3E+06	2.2E-06	2.2E-07	2.5E-06	1.9E-09

NCSA-1a-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	3.9E+00	0.0E+00	3.9E+00	2.8E+02*	0.0E+00	2.8E+02*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	1.4E-01*	0.0E+00	1.4E-01*	0.0E+00
CHROMIUM	8.8E+00	0.0E+00	8.8E+00	1.1E+01*	0.0E+00	1.1E+01*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	8.5E-04	0.0E+00	8.5E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.3E-02	0.0E+00	1.3E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	1.3E-01*	0.0E+00	1.3E-01*	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.8E-04	0.0E+00	1.8E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	2.1E+02*	1.0E+03*	1.2E+03*	0.0E+00
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-09
BENZENE	1.1E+03	4.1E-01	4.1E-01	1.5E-03	3.9E+00*	3.9E+00*	4.7E+01
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-04
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	2.5E-04
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	8.0E-01
CHLORDANE	2.5E+01	1.0E+06	2.5E+01	1.6E+01*	2.9E-02a	1.6E+01*	0.0E+00
CHLOROBENZENE	8.8E+04	5.2E+01	2.5E+01	5.0E-05	8.4E-02	8.5E-02	2.6E+00
CHLOROFORM	5.1E+03	5.4E+00	5.4E+00	5.3E-05	5.0E-02	5.0E-02	2.3E+03
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	1.9E+04	1.6E+04	5.8E-05	2.8E-04	3.4E-04	1.2E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	6.5E+02	6.5E+02	2.2E-05	3.1E-03	3.1E-03	6.3E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	1.9E+04	1.6E+04	6.6E-05	3.2E-04	3.8E-04	4.6E-06
PPDDE	9.3E+01	7.6E+03	9.2E+01	1.1E-01*	1.3E-03	1.1E-01*	2.2E-04
PPDDT	9.3E+01	1.0E+06	9.2E+01	6.4E-01*	3.7E-03a	6.5E-01*	0.0E+00
DIBROMOCHLOROPROPANE	2.3E+01	4.8E+00	3.9E+00	3.1E-04	1.5E-03	1.8E-03	2.4E-01
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	7.8E-05
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-01
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	1.7E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	9.7E-01	9.7E-01	1.7E-04	3.1E+00*	3.1E+00*	2.4E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	3.5E+02*	1.2E+01*	3.6E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	2.7E-05	6.1E-02	6.1E-02	2.4E-03
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-03
DIMETHYMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	1.7E-05	0.0E+00	1.7E-05	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	6.5E-02	5.8E-03a	7.1E-02	0.0E+00
ETHYLBENZENE	4.6E+05	2.8E+02	2.8E+02	1.6E-05	2.5E-02	2.5E-02	7.4E-05
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	9.7E-01*	0.0E+00	9.7E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.6E+01	1.6E+01	1.8E-02	6.2E+00*	6.2E+00*	0.0E+00
ISODRIN	3.2E+02	1.0E+06	2.9E+02	1.5E-01*	1.6E-02a	1.7E-01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.4E+06	0.0E+00	1.4E+06	3.6E-06	0.0E+00	3.6E-06	0.0E+00
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-08
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	3.1E-03
METHYLENE CHLORIDE	4.1E+03	8.5E-01	8.5E-01	4.9E-04	2.3E+00*	2.3E+00*	2.6E+01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	5.1E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-09
TETRACHLOROETHYLENE	6.5E+02	6.3E+00	6.2E+00	5.1E-03	5.2E-01*	5.3E-01*	1.3E-01
TOLUENE	1.4E+06	9.8E+02	9.8E+02	6.4E-07	9.1E-04	9.1E-04	2.1E-04
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-04
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-01
TRICHLOROETHYLENE	2.9E+03	2.2E+00	2.2E+00	3.8E-04	5.0E-01*	5.0E-01*	7.1E+00
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-04
M-XYLENE	7.0E+06	3.0E+03	3.0E+03	1.9E-06	4.4E-03	4.4E-03	4.3E-05
O,P-XYLENE	7.0E+06	3.0E+03	3.0E+03	1.9E-06	4.4E-03	4.4E-03	2.7E-04

NCSA-1a-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ARSENIC	2.0E+01	0.0E+00	2.0E+01	5.5E+01*	0.0E+00	5.5E+01*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	2.3E-02	0.0E+00	2.3E-02	0.0E+00
CHROMIUM	5.5E+01	0.0E+00	5.5E+01	1.8E+00*	0.0E+00	1.8E+00*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	1.2E-03	0.0E+00	1.2E-03	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.8E-02	0.0E+00	1.8E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.8E-01*	0.0E+00	1.8E-01*	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	2.4E-04	0.0E+00	2.4E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	2.6E+06	4.0E-01	9.0E-02	3.4E+03*	1.0E+03*	4.4E+03*	0.0E+00	0.0E+00
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-14	1.3E-09
BENZENE	6.7E+01	2.0E+04	4.1E-01	4.1E-01	2.4E-02	3.9E+00*	3.9E+00*	1.2E-03	1.4E+02
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-09	1.3E-04
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-09	2.5E-04
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-05	2.4E+00
CHLORDANE	1.5E+00	1.0E+06	1.0E+06	1.5E+00	2.6E+02*	8.8E-02a	2.6E+02*	0.0E+00	0.0E+00
CHLOROBENZENE	1.5E+04	1.3E+06	2.6E+01	2.6E+01	2.9E-04	1.7E-01*	1.7E-01*	2.1E-05	2.6E+00
CHLOROFORM	3.1E+02	3.0E+05	5.4E+00	5.3E+00	8.7E-04	5.0E-02	5.1E-02	5.6E-02	6.8E+03
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	2.4E+07	5.7E+04	1.3E+04	3.2E-04	9.3E-05	4.1E-04	1.0E-09	1.2E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	4.3E+07	2.0E+03	1.8E+03	1.2E-04	1.0E-03	1.1E-03	5.2E-10	6.3E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	4.8E+07	5.7E+04	1.3E+04	3.6E-04	1.1E-04	4.6E-04	3.9E-11	4.6E-06
PPDDE	5.7E+00	1.6E+08	2.5E+03	5.7E+00	1.7E+00*	3.9E-03	1.8E+00*	5.5E-09	6.7E-04
PPDDT	5.7E+00	1.0E+06	1.0E+06	5.7E+00	1.0E+01*	1.1E-02a	1.0E+01*	0.0E+00	0.0E+00
DIBROMOCHLOROPROPANE	1.4E+00	1.7E+03	4.8E+00	1.1E+00	5.0E-03	1.5E-03	6.5E-03	6.0E-06	7.2E-01
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-09	2.4E-04
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-06	3.2E-01
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-05	5.2E+00
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	4.2E+04	2.9E+00	2.9E+00	2.6E-03	1.0E+00*	1.0E+00*	2.0E-05	2.4E+00
DIELDRIN	1.2E-01	1.2E+06	1.9E+01	1.2E-01	5.7E+03*	3.6E+01*	5.8E+03*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	1.0E+07	1.6E+02	1.6E+02	1.5E-04	6.1E-02	6.2E-02	2.0E-08	2.4E-03
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-08	1.5E-03
DIMETHYMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	9.5E-05	0.0E+00	9.5E-05	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	3.5E-01*	5.8E-03a	3.6E-01*	0.0E+00	0.0E+00
ETHYLBENZENE	8.5E+04	3.4E+07	8.5E+02	8.4E+02	8.5E-05	8.5E-03	8.6E-03	6.2E-10	7.4E-05
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	5.3E+00*	0.0E+00	5.3E+00*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	1.0E+06	1.6E+01	1.6E+01	2.6E-01*	6.2E+00*	6.4E+00*	0.0E+00	0.0E+00
ISODRIN	5.9E+01	1.0E+06	1.0E+06	5.8E+01	8.3E-01*	1.6E-02a	8.4E-01*	0.0E+00	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+05	0.0E+00	0.0E+00	2.5E+05	1.9E-05	0.0E+00	1.9E-05	0.0E+00	0.0E+00
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.9E-13	4.7E-08
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-08	3.1E-03
METHYLENE CHLORIDE	2.5E+02	4.2E+04	8.5E-01	8.5E-01	8.1E-03	2.3E+00*	2.4E+00*	6.4E-04	7.7E+01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	4.2E-13	5.1E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	9.9E-15	1.2E-09
TETRACHLOROETHYLENE	4.1E+01	2.7E+05	6.3E+00	5.5E+00	8.0E-02	5.2E-01*	6.0E-01*	3.3E-06	4.0E-01
TOLUENE	2.6E+05	1.4E+08	2.9E+03	2.9E+03	3.4E-06	3.0E-04	3.1E-04	1.8E-09	2.1E-04
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	5.2E-09	6.2E-04
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-06	4.5E-01
TRICHLOROETHYLENE	1.8E+02	1.2E+05	2.2E+00	2.2E+00	6.3E-03	5.0E-01*	5.0E-01*	1.8E-04	2.1E+01
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	6.8E-09	8.2E-04
M-XYLENE	8.8E+05	1.9E+08	4.4E+02	4.4E+02	1.5E-05	2.9E-02	2.9E-02	3.6E-10	4.3E-05
O,P-XYLENE	8.8E+05	1.9E+08	4.4E+02	4.4E+02	1.5E-05	2.9E-02	2.9E-02	2.2E-09	2.7E-04

NCSA-1a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	6.8E+02*	0.0E+00	6.8E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	1.1E+00*	0.0E+00	1.1E+00*	0.0E+00	0.0E+00
CHROMIUM	1.1E+00	0.0E+00	0.0E+00	1.1E+00	8.7E+01*	0.0E+00	8.7E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	3.7E-03	0.0E+00	3.7E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	5.5E-02	0.0E+00	5.5E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	5.4E-01*	0.0E+00	5.4E-01*	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.4E-03	0.0E+00	1.4E-03	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.2 SITE NCSA-1b: LIME SETTLING BASINS (formerly Site 36-4: Lime Settling Basins; ESE, 1987b/RIC 87203R02 and ESE, 1988b/RIC 87203R02A; Site 36-5: Mercury Spill, ESE, 1988cc/RIC 88063R01; Site 36-10: Pit; ESE, 1988g/RIC 88033R02)

2.2.1 Site-Specific Considerations

Figure NCSA-1b-1 and Tables NCSA-1b-1 and NCSA-1b-2 depict the target contaminants for site NCSA-1b. Borings 3049, 3163 through 3172, 3203, 3206, 3413, 3414, 3416, 3418 through 3422, 3424 through 3429, 3492 and 3730 through 3732 from Site 36-4; 3146 and 3149 from Site 36 through 10; and 3133 through 3137, 3139, and 3140 from Site 36-5, were included in this exposure assessment, consistent with the North Central SAR. The historical search conducted under the contamination assessment revealed that mustard may have been disposed of on this site (ESE, 1987b/RIC 87203R02); however, mustard and its degradation products were not detected in soil during the Phase I and Phase II investigations. According to site history, no other chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-1b (ESE, 1987b/RIC 87203R02).

2.2.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1b are shown in Figure NCSA-1b-1. Toluene, occurring in Boring 3167 (2-3 ft), was not included in this figure because it was detected in the nontarget analysis, but it is still considered a target contaminant for this exposure assessment (see Appendix A). The following contaminants were not included in this figure, since they were not considered target contaminants during the Phase I and Phase II investigations: 2-Butoxyethanol, occurring in Boring 3171 (2-3 ft); fluoranthene, occurring in Borings 3168 (0-1 ft) and 3421 (2-3 and 6-7 ft); hexachlorobutadiene occurring in Boring 3421 (2-3 ft); methyl naphthalene occurring in Boring 3168 (4-5 ft); methylphosphonic acid occurring in Boring 3732 (4-5 ft); oxybisethanol occurring in Borings 3167 (0-1 ft), 3169 (2-3 ft), and 3171 (2-3 ft); phosphoric acid, triphenyl ester occurring in Borings 3163 (0-1 and 2-3 ft), 3167 (0-1 and 2-3 ft), 3169 (0-1 ft) and 3171 (0-1 and 2-3 ft); and pyrene occurring in Borings 3168 (0-1 ft) and 3421 (2-3 and 6-7 ft). Although not shown on this figure, 2-butoxyethanol, fluoranthene, hexachlorobutadiene, methyl naphthalene, methylphosphonic

acid, oxybisethanol, phosphoric acid, triphenyl ester, and pyrene were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO 1988a/RIC 88357R01).

Table NCSA-1b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1b-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.2.3 Site Exposure Summary

Tables NCSA-1b-3 through NCSA-1b-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1b is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Chloroform	--	--	--	--	Cumulative
Aldrin	Direct	Direct	Dir/Ind	Dir/Ind	Dir/Ind
Chlordane	Direct	Direct	Direct	Direct	Dir/Ind
PPDDE	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Fluoroacetic acid	Direct	Direct	Direct	Direct	Direct
Isodrin	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
PPDDT	--	--	Direct	Indirect	Dir/Ind
Benzene	--	--	--	Indirect	Indirect
Dibromochloropropane	--	--	--	Indirect	Indirect
Methylene chloride	--	--	--	Indirect	Indirect

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Endrin	--	--	--	--	Direct
Cadmium	--	--	--	--	Direct
Lead	--	--	--	--	Direct
Mercury	--	--	--	--	Direct
Dicyclopentadiene	--	--	--	Indirect	--

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. It should be noted for chloroform, the cumulative EI exceeds 0.1 for an industrial worker but the direct and indirect EIs do not exceed 0.1. Site NCSA-1b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Chloroform (open, enclosed)
- Methylene chloride (enclosed)
- Carbon tetrachloride (enclosed)
- Trichloroethylene (enclosed)

2-3	Aldrin	15
	Dieldrin	0.30
	ChlCP	0.50
2-3	Aldrin	18
	PPDE	25
	Dieldrin	120
	PPDT	0.86
	Endrin	36
	As	44
	Hg	20
7-8	Dieldrin	0.008
	Endrin	0.002
	As	93
	Hg	11

3413

0-1	PPDE	0.02
	PPDT	0.02
	Dieldrin	0.41
	Endrin	0.12
	Hg	0.08
2-3	Dieldrin	0.07
	Endrin	0.002
	Hg	0.13

3414

0-1	Aldrin	5.9
	PPDE	0.19
	PPDT	1.6
	Dieldrin	14
	Endrin	1.1
	Isodrin	0.21
	As	24
	Hg	0.36
2-3	Dieldrin	0.010
	Endrin	0.20
	As	87
	Hg	0.74

3149

3146

3418

0-1	Dieldrin	0.025
	Endrin	0.014
	ChlCP	0.24
2-3	Dieldrin	0.07
	Endrin	0.014
	Hg	0.05

3420

0-1	Aldrin	1.5
	Dieldrin	8.2
	Endrin	0.21
	Isodrin	0.14
	Hg	0.24
2-3	Dieldrin	0.006
	Endrin	0.002

2-3	Aldrin	4.2
	PPDE	0.39
	PPDT	0.51
	Dieldrin	36
	Endrin	19
	Isodrin	8.7
	Zn	250
	As	13
	Hg	0.83
5-8	Aldrin	0.018
	Dieldrin	0.00
	Endrin	0.00
	Isodrin	0.036
	As	7.4
	Endrin	0.00

3492

3203

3049

3167

2-3	Aldrin	>80
	PPDE	56
	Dieldrin	12
	Endrin	5.6
	PPDT	0.019
	CLDAN	>0.21
	As	13
	Hg	0.36
4-5	Aldrin	38
	Isodrin	10
	PPDE	>0.040
	Dieldrin	5.8
	Endrin	2.6
	CLDAN	>0.21
	Hg	0.11
	As	>40
	MF4	5.1
	CPMSO2	1

2-3	Aldrin	120
	Isodrin	50
	Dieldrin	30
	Endrin	8.8
	As	31
	Hg	0.19
	CLDAN	3
	CPMSO2	0.6
3-5	Aldrin	0.012
	PPDE	0.001
	Dieldrin	0.003
	As	18
7-8	Dieldrin	0.12
	As	120

3730

3165

3422

0-1	Aldrin	22
	Dieldrin	39
	Endrin	30
	Isodrin	1.6
	FC2A	>4.5
	As	17
	Hg	0.20
2-3	Aldrin	28
	Dieldrin	60
	Endrin	4.8
	CPMS	1.7
	CPMSO2	70
	As	51
	Hg	1.4
6-7	Aldrin	2.5
	Endrin	2.2
	Isodrin	0.44
	CPMSO2	0.29
	CPMSO2	5
	FC2A	14
	FC2A	26
	As	71

3731

3168

3421

3168

3166

3420

3422

TABLE NCSA-1b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1b

Contaminant	Horizon 1				Horizon 2			
	Max. (ug/g)	Depth (ft)	Boring Number		Max. (ug/g)	Depth (ft)	Boring Number	
Aldrin	600	0-1	3172		600	0-1	3172	
Benzene	6	4-5	3167		6	4-5	3167	
2-Butoxyethanol ^{1/}	3.0	2-3	3171		3.0	2-3	3171	
Chlordane	30	0-1	3165		30	0-1	3165	
Chlorobenzene	2	4-5	3167		2	4-5	3167	
Chloroform	7	4-5	3167		7	4-5	3167	
		2-3	3171			2-3	3171	
Chlorophenylmethyl sulfide	20	4-5	3168		20	4-5	3168	
Chlorophenylmethyl sulfone	50	4-5	3168		50	4-5	3168	
Chlorophenylmethyl sulfoxide	10	4-5	3166		10	4-5	3166	
PPDDE ^{2/}	25	4-5	3413		25	4-5	3413	
PPDDT ^{3/}	7	0-1	3171		7	0-1	3171	
Dibromochloropropane	0.023	6-7	3428		0.023	6-7	3428	
Dicyclopentadiene	7.1	2-3	3421		7.1	2-3	3421	
Dieldrin	120	4-5	3413		120	4-5	3413	
Endrin	40	Comp ^{4/}	3049		40	Comp	3049	
		0-1,				0-1,		
		4-5				4-5		
Fluoranthene ^{1/}	100	2-3	3421		100	2-3	3421	
Fluoroacetic acid	260	6-7	3422		260	6-7	3422	
Hexachlorobutadiene ^{1/}	2.0	2-3	3421		2.0	2-3	3421	
Hexachlorocyclopentadiene	0.50	2-3	3413		0.50	2-3	3413	
Isodrin	300	4-5	3166		300	4-5	3166	
Methylene chloride	2	4-5	3164		2	4-5	3164	
Methyl naphthalene ^{1/}	9.0	4-5	3168		9.0	4-5	3168	
Methyl phosphonic acid ^{1/}	>400	4-5	3732		>400	4-5	3732	

TABLE NCSA-1b-1 (Continued)
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Oxybisethanol ^{1/}	4.0	2-3	3171	4.0	2-3	3171
Phosphoric acid, triphenyl ester ^{2/}	10	0-1	3163	10	0-1	3163
Pyrene ^{3/}	100	2-3	3163	100	2-3	3163
Tetrachloroethylene	0.25	2-3	3421	0.25	2-3	3421
Toluene	4.0	6-7	3422	4.0	6-7	3422
Arsenic	370	2-3	3167	--	2-3	3167
Cadmium	3.7	4-5	3167	--	--	--
Copper	270	4-5	3167	--	--	--
Lead	230	4-5	3168	--	--	--
Mercury	110	4-5	3168	--	--	--
Zinc	500	2-3	3421	--	--	--
		4-5	3168	--	--	--

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

2/ PPDE 2,2-bis-(Para-chlorophenyl)-1,1-dichloroethene

3/ PPDDT 2,2-bis-(Para-chlorophenyl)-1,1,1-trichloroethane

4/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA North Central Study Area

Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-1b-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1b

AVERAGE SITE DEPTH TO GROUNDWATER: 20 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,2-TRICHLOROETHANE	25	36109	02/11/88
1,1-DICHLOROETHANE	19	36109	02/11/88
CARBON TETRACHLORIDE	120	36109	02/11/88
METHYLENE CHLORIDE	3200	36109	02/11/88
CHLOROFORM	460000	36109	02/11/88
CHLOROBENZENE	780	36109	02/11/88
CHLOROPHENYLMETHYL SULFIDE	170	36109	02/11/88
CHLOROPHENYLMETHYL SULFONE	25	36109	02/11/88
DIBROMOCHLOROPROPANE	35	36109	02/11/88
DITHIANE	150	36109	02/11/88
DIMETHYL DISULFIDE	12	36109	02/11/88
METHYLISOBUTYL KETONE	2400	36109	02/11/88
1,4-OXATHIANE	16	36109	02/11/88
PPDDT	3.0	36109	02/11/88
TETRACHLOROETHYLENE	88	36109	02/11/88
TRICHLOROETHYLENE	270	36109	02/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	4.0E+02*	8.9E-03a	4.0E+02*	0.0E+00
BENZENE	8.6E+02	1.7E+03	5.8E+02	7.0E-03	3.4E-03	1.0E-02	0.0E+00
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	8.1E-03
CHLORDANE	2.0E+01	7.2E+06	2.0E+01	1.5E+00*	4.1E-06	1.5E+00*	0.0E+00
CHLOROBENZENE	1.6E+05	2.4E+05	9.7E+04	1.2E-05	8.3E-06	2.1E-05	2.6E-05
CHLOROFORM	4.0E+03	6.2E+03	2.4E+03	1.7E-03	1.1E-03	2.9E-03	2.6E-01
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	4.1E+06	1.6E+05	1.2E-04	4.8E-06	1.3E-04	2.3E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.0E+06	1.4E+05	3.1E-04	4.6E-05a	3.5E-04	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	6.6E+05	1.3E+05	6.1E-05	1.5E-05	7.6E-05	0.0E+00
PPDDE	7.4E+01	1.0E+06	7.4E+01	3.4E-01*	6.2E-06a	3.4E-01*	0.0E+00
PPDDT	7.4E+01	1.0E+06	7.4E+01	9.5E-02	8.2E-07a	9.5E-02	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.4E+01	1.4E+01	1.3E-03	3.6E-04	1.6E-03	2.8E-04
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-08
DICYCLOPENTADIENE	5.4E+04	2.9E+03	2.8E+03	1.3E-04	2.4E-03	2.6E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	7.6E+01*	3.9E-03a	7.6E+01*	0.0E+00
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-07
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	1.6E-02	1.6E-06a	1.6E-02	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	6.7E+00*	0.0E+00	6.7E+00*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	8.4E+02	8.0E+02	3.0E-05	5.9E-04	6.2E-04	0.0E+00
ISODRIN	5.8E+02	1.0E+06	5.8E+02	5.2E-01*	6.2E-05a	5.2E-01*	0.0E+00
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	6.0E-07
METHYLENE CHLORIDE	3.3E+03	2.5E+03	1.4E+03	6.1E-04	8.1E-04	1.4E-03	2.4E-03
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	4.6E+04	5.1E+02	4.9E-04	5.4E-06	4.9E-04	1.5E-04
TOLUENE	2.5E+06	4.1E+07	2.3E+06	1.6E-06	9.8E-08	1.7E-06	0.0E+00
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-05
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	9.0E-04
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.7E+01*	0.0E+00	1.7E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.2E-03	0.0E+00	8.2E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	6.5E-04	0.0E+00	6.5E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	1.5E-02	0.0E+00	1.5E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-02	0.0E+00	3.3E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	2.5E-04	0.0E+00	2.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1b-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	4.0E+02*	8.9E-03a	4.0E+02*	0.0E+00
BENZENE	8.6E+02	1.7E+03	5.8E+02	7.0E-03	3.4E-03	1.0E-02	0.0E+00
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	8.1E-03
CHLORDANE	2.0E+01	7.2E+06	2.0E+01	1.5E+00*	4.1E-06	1.5E+00*	0.0E+00
CHLOROBENZENE	1.6E+05	2.4E+05	9.7E+04	1.2E-05	8.3E-06	2.1E-05	2.6E-05
CHLOROFORM	4.0E+03	6.2E+03	2.4E+03	1.7E-03	1.1E-03	2.9E-03	2.6E-01
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	4.1E+06	1.6E+05	1.2E-04	4.8E-06	1.3E-04	2.3E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.0E+06	1.4E+05	3.1E-04	4.6E-05a	3.5E-04	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	6.6E+05	1.3E+05	6.1E-05	1.5E-05	7.6E-05	0.0E+00
PPDDE	7.4E+01	1.0E+06	7.4E+01	3.4E-01*	6.2E-06a	3.4E-01*	0.0E+00
PPDDT	7.4E+01	1.0E+06	7.4E+01	9.5E-02	8.2E-07a	9.5E-02	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.4E+01	1.4E+01	1.3E-03	3.6E-04	1.6E-03	2.8E-04
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-08
DICYCLOPENTADIENE	5.4E+04	2.9E+03	2.8E+03	1.3E-04	2.4E-03	2.6E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	7.6E+01*	3.9E-03a	7.6E+01*	0.0E+00
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-07
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	1.6E-02	1.6E-06a	1.6E-02	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	6.7E+00*	0.0E+00	6.7E+00*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	8.4E+02	8.0E+02	3.0E-05	5.9E-04	6.2E-04	0.0E+00
ISODRIN	5.8E+02	1.0E+06	5.8E+02	5.2E-01*	6.2E-05a	5.2E-01*	0.0E+00
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	6.0E-07
METHYLENE CHLORIDE	3.3E+03	2.5E+03	1.4E+03	6.1E-04	8.1E-04	1.4E-03	2.4E-03
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	4.6E+04	5.1E+02	4.9E-04	5.4E-06	4.9E-04	1.5E-04
TOLUENE	2.5E+06	4.1E+07	2.3E+06	1.6E-06	9.8E-08	1.7E-06	0.0E+00
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-05
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	9.0E-04
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.7E+01*	0.0E+00	1.7E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.2E-03	0.0E+00	8.2E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	6.5E-04	0.0E+00	6.5E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	1.5E-02	0.0E+00	1.5E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-02	0.0E+00	3.3E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	2.5E-04	0.0E+00	2.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1b-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	4.5E+03	2.1E-01	2.9E+03*	1.3E-01*	2.9E+03*	0.0E+00
BENZENE	1.2E+02	2.7E+02	8.3E+01	5.0E-02	2.2E-02	7.2E-02	0.0E+00
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-01
CHLORDANE	2.7E+00	4.8E+05	2.7E+00	1.1E+01*	6.2E-05	1.1E+01*	0.0E+00
CHLOROBENZENE	6.8E+04	8.7E+04	3.8E+04	2.9E-05	2.3E-05	5.2E-05	1.7E-04
CHLOROFORM	5.6E+02	9.5E+02	3.5E+02	1.2E-02	7.3E-03	2.0E-02	4.0E+00
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	1.6E+05	4.8E+04	2.9E-04	1.3E-04	4.1E-04	1.5E-06
CHLOROPHENYLMETHYL SULFONE	7.0E+04	1.0E+06	4.9E+04	7.2E-04	3.0E-04a	1.0E-03	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	1.0E+05	4.2E+04	1.4E-04	9.7E-05	2.4E-04	0.0E+00
PPDDE	1.0E+01	1.0E+06	1.0E+01	2.4E+00*	9.3E-05a	2.4E+00*	0.0E+00
PPDDT	1.0E+01	1.0E+06	1.0E+01	6.9E-01*	1.2E-05a	6.9E-01*	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	3.8E+00	1.5E+00	9.2E-03	6.0E-03	1.5E-02	4.2E-03
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-07
DICYCLOPENTADIENE	1.8E+04	1.1E+03	1.0E+03	3.9E-04	6.7E-03	7.1E-03	0.0E+00
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	5.5E+02*	5.9E-02a	5.5E+02*	0.0E+00
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-06
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	3.8E-02	1.0E-05a	3.8E-02	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	1.6E+01*	0.0E+00	1.6E+01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	3.0E+02	2.9E+02	8.8E-05	1.6E-03	1.7E-03	0.0E+00
ISODRIN	2.5E+02	1.0E+06	2.5E+02	1.2E+00*	4.0E-04a	1.2E+00*	0.0E+00
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-06
METHYLENE CHLORIDE	4.5E+02	3.8E+02	2.1E+02	4.4E-03	5.2E-03	9.7E-03	3.7E-02
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	7.1E+01	7.1E+03	7.0E+01	3.5E-03	3.5E-05	3.6E-03	2.3E-03
TOLUENE	1.1E+06	1.5E+07	9.9E+05	3.8E-06	2.7E-07	4.0E-06	0.0E+00
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	5.6E-04
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-02
ARSENIC	3.9E+00	0.0E+00	3.9E+00	9.4E+01*	0.0E+00	9.4E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	6.4E-02	0.0E+00	6.4E-02	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	1.1E-03	0.0E+00	1.1E-03	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	2.5E-02	0.0E+00	2.5E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	5.6E-02	0.0E+00	5.6E-02	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	4.8E-04	0.0E+00	4.8E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	3.2E+02*	4.8E+00*	3.2E+02*	0.0E+00
BENZENE	1.1E+03	2.5E+01	2.5E+01	5.5E-03	2.4E-01*	2.4E-01*	0.0E+00
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	8.2E+00
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	1.2E+00*	2.2E-03	1.2E+00*	0.0E+00
CHLOROBENZENE	8.8E+04	4.8E+03	4.5E+03	2.3E-05	4.2E-04	4.4E-04	7.8E-02
CHLOROFORM	5.1E+03	8.9E+01	8.8E+01	1.4E-03	7.8E-02	8.0E-02	2.7E+02
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	2.1E+03	2.1E+03	2.2E-04	9.5E-03	9.7E-03	6.9E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	1.0E+06	6.7E+02	5.5E-04	7.4E-02a	7.4E-02	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	2.1E+03	2.1E+03	1.1E-04	4.7E-03	4.9E-03	0.0E+00
PPDDE	9.3E+01	1.9E+01	1.6E+01	2.7E-01*	1.3E+00*	1.6E+00*	0.0E+00
PPDDT	9.3E+01	1.9E+01	1.6E+01	7.5E-02	3.6E-01*	4.3E-01*	0.0E+00
DIBROMOCHLOROPROPANE	2.3E+01	4.4E-02	4.4E-02	1.0E-03	5.3E-01*	5.3E-01*	2.8E-01
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-05
DICYCLOPENTADIENE	1.7E+04	5.8E+01	5.7E+01	4.1E-04	1.2E-01*	1.2E-01*	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	6.0E+01*	2.1E+00*	6.2E+01*	0.0E+00
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-03
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	2.9E-02	2.6E-03a	3.2E-02	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	1.2E+01*	0.0E+00	1.2E+01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.9E+01	1.9E+01	9.2E-05	2.6E-02	2.6E-02	0.0E+00
ISODRIN	3.2E+02	1.0E+06	2.9E+02	9.4E-01*	9.9E-02a	1.0E+00*	0.0E+00
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-03
METHYLENE CHLORIDE	4.1E+03	4.4E+00	4.4E+00	4.9E-04	4.6E-01*	4.6E-01*	2.5E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	6.5E+02	2.2E+02	1.7E+02	3.8E-04	1.1E-03	1.5E-03	1.5E-01
TOLUENE	1.4E+06	5.5E+05	3.9E+05	2.9E-06	7.3E-06	1.0E-05	0.0E+00
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	3.8E-02
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	9.2E-01
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.9E+01*	0.0E+00	1.9E+01*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	1.0E-02	0.0E+00	1.0E-02	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	1.5E-03	0.0E+00	1.5E-03	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	3.5E-02	0.0E+00	3.5E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	7.9E-02	0.0E+00	7.9E-02	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	6.4E-04	0.0E+00	6.4E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	8.9E+03	4.2E+01	1.2E-01	5.2E+03*	1.4E+01*	5.2E+03*	0.0E+00	0.0E+00
BENZENE	6.7E+01	2.3E+02	2.5E+01	1.7E+01	8.9E-02	2.6E-01*	3.5E-01*	0.0E+00	0.0E+00
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	6.1E-02	2.5E+01
CHLORDANE	1.5E+00	9.6E+05	5.2E+00	1.2E+00	2.0E+01*	5.8E+00*	2.6E+01*	0.0E+00	0.0E+00
CHLOROBENZENE	1.5E+04	3.2E+04	1.4E+04	6.0E+03	1.3E-04	2.0E-04	3.3E-04	1.9E-04	7.8E-02
CHLOROFORM	3.1E+02	8.2E+02	8.9E+01	6.4E+01	2.2E-02	8.7E-02	1.1E-01*	2.0E+00	8.0E+02
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	5.5E+05	6.3E+03	4.6E+03	1.2E-03	3.2E-03	4.4E-03	1.7E-06	6.9E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	1.0E+06	1.0E+06	6.5E+02	3.0E-03	7.4E-02a	7.7E-02	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	8.8E+04	6.3E+03	4.4E+03	6.0E-04	1.7E-03	2.3E-03	0.0E+00	0.0E+00
PPDDE	5.7E+00	5.4E+05	1.9E+01	4.4E+00	4.4E+00*	1.3E+00*	5.7E+00*	0.0E+00	0.0E+00
PPDDT	5.7E+00	1.1E+06	1.9E+01	4.4E+00	1.2E+00*	3.6E-01*	1.6E+00*	0.0E+00	0.0E+00
DIBROMOCHLOROPROPANE	1.4E+00	8.5E+00	4.4E-02	4.2E-02	1.6E-02	5.3E-01*	5.5E-01*	2.1E-03	8.4E-01
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-07	6.1E-05
DICYCLOPENTADIENE	1.2E+03	3.9E+02	1.7E+02	1.1E+02	6.0E-03	5.9E-02	6.5E-02	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	4.1E+03	1.9E+01	1.2E-01	9.8E+02*	6.3E+00*	9.9E+02*	0.0E+00	0.0E+00
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	3.1E-06	1.2E-03
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	1.6E-01*	2.6E-03a	1.6E-01*	0.0E+00	0.0E+00
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	6.5E+01*	0.0E+00	6.5E+01*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	1.1E+02	5.8E+01	3.5E+01	1.3E-03	1.3E-02	1.4E-02	0.0E+00	0.0E+00
ISODRIN	5.9E+01	1.0E+06	1.0E+06	5.8E+01	5.1E+00*	9.9E-02a	5.2E+00*	0.0E+00	0.0E+00
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-06	1.8E-03
METHYLENE CHLORIDE	2.5E+02	3.3E+02	4.4E+00	4.2E+00	8.1E-03	4.6E-01*	4.7E-01*	1.8E-02	7.5E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	4.1E+01	6.1E+03	2.2E+02	3.4E+01	6.	1.2E-03	7.2E-03	1.1E-03	4.6E-01
TOLUENE	2.6E+05	5.5E+06	1.6E+06	2.1E+05	1.	3.2E-06	1.9E-05	0.0E+00	0.0E+00
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-04	1.1E-01
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-03	2.7E+00
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	2.3E+02*	0.0E+00	2.3E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	4.9E-01*	0.0E+00	4.9E-01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	4.7E-03	0.0E+00	4.7E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	1.0E-01*	0.0E+00	1.0E-01*	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.4E-01*	0.0E+00	2.4E-01*	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	3.6E-03	0.0E+00	3.6E-03	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux.
The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.3 SITE NCSA-1c: DRAINAGE DITCH (formerly Site 36-8; Chemical Drainage Ditch; ESE, 1987c/RIC 87113R01 and ESE, 1988c/RIC 87113R01A; Site 36-7: Solid Waste Burial/Sanitary Pit; ESE, 1988f/RIC 88063R07 and ESE, 1988bb/RIC 88063R07A)

2.3.1 Site-Specific Considerations

Figure NCSA-1c-1 and Tables NCSA-1c-1 and NCSA-1c-2 depict the target contaminants for site NCSA-1c. Borings 3053, 3183, 3184, and 3400 through 3412 from Site 36-8, and 3122 and 3123 from Site 36-7 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from RMA target contaminant list were suspected to be present in Site NCSA-1c (ESE, 1987c/RIC 87113R01; ESE, 1988f/RIC 88063R07).

2.3.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1c are shown in Figure NCSA-1c-1. Methylphosphonic acid, occurring in Boring 3405 (14-15 ft) was not included in the figure, since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown on this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-1c-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Tetrachloroethylene, shown in Table NCSA-1c-1, is excluded from consideration in the exposure analysis for this site, because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1c-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.3.3 Site Exposure Summary

Tables NCSA-1c-3 through NCSA-1c-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1c is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Fluoracetic acid	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
Aldrin	--	--	Direct	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-1c is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

TABLE NCSA-1c-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1c

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	0.047	0-1	3402	0.047	0-1	3402
Chlordane	>0.11	0-1	3402	>0.11	0-1	3402
		4.5-5.5	3402	4.5-5.5	3402	
		0-1	3406	0-1	3406	
		0-1	3411	0-1	3411	
PPDDE ^{1/}	0.29	0-1	3402	0.29	0-1	3402
PPDDT ^{2/}	0.010	0-1	3409	0.010	0-1	3409
Dieldrin	>2.0	0-1	3403	>2.0	0-1	3403
		0-1	3406	0-1	3406	
Diisopropylmethyl phosphonate	5	4-5	3184	5	4-5	3184
Endrin	>2.0	0-1	3403	>2.0	0-1	3403
		0-1	3406		0-1	3406
Fluoroacetic acid	9.3	4-5	3412	9.3	4-5	3412
Isodrin	0.023	0-1	3405	0.023	0-1	3405
Methyl phosphonic acid ^{3/}	--	--	--	43	14-15	3405
Tetrachloroethylene	0.20	0-1	3053	0.20	0-1	3053
Arsenic	57	4-5	3405	--	--	--
Mercury	1.9	0-1	3409	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-1c-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1c
AVERAGE SITE DEPTH TO GROUNDWATER: 25 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	3.1	36146	05/10/88
1,2-DICHLOROETHANE	22	36139	01/3/89
ALDRIN	5.2	36139	05/9/88
ATRAZINE	160	36137	01/3/89
BENZENE	3.3	36142	02/12/88
CARBON TETRACHLORIDE	1.2	36141	02/11/88
CHLOROFORM	4.1	36139	02/8/88
HEXACHLOROCYCLOPENTADIENE	0.065	36139	01/3/89
CHLOROBENZENE	3.4	36142	02/12/88
CHLORDANE	7.0	36137	01/3/89
CHLOROPHENYLMETHYL SULFIDE	14	36137	01/3/89
CHLOROPHENYLMETHYL SULFONE	GT 130	36139	02/8/88
DIISOPROPYLMETHYL PHOSPHONATE	9000	36142	02/12/88
DITHIANE	1100	36142	02/12/88
DIELDRIN	0.31	36137	01/3/89
DIMETHYLMETHYL PHOSPHONATE	55	36137	01/3/89
ENDRIN	0.14	36137	01/3/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1c-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1c
AVERAGE SITE DEPTH TO GROUNDWATER: 25 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ISODRIN	1.6	36137	01/3/89
TOLUENE	4.0	36139	02/8/88
MALATHION	GT 500	36139	01/3/89
1,4-OXATHIANE	210	36137	01/3/89
PPDDE	0.28	36139	01/3/89
PPDDT	0.29	36137	01/3/89
TETRACHLOROETHYLENE	2.1	36146	05/10/88
TRICHLOROETHYLENE	5.2	36142	02/12/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1c-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.4E+06	1.5E+00	3.1E-02	3.4E-08	3.1E-02	6.4E-07
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	8.1E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-07
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-06
CHLORDANE	2.0E+01	1.5E+08	2.0E+01	5.6E-03	7.4E-10	5.6E-03	3.9E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	9.2E-08
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.4E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	8.0E-11
PPDDE	7.4E+01	8.3E+07	7.4E+01	3.9E-03	3.5E-09	3.9E-03	3.2E-09
PPDDT	7.4E+01	1.8E+08	7.4E+01	1.4E-04	5.7E-11	1.4E-04	2.4E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-06
DIELDRIN	1.6E+00	6.3E+05	1.6E+00	1.3E+00*	3.2E-06	1.3E+00*	1.1E-09
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	5.3E+06	5.9E+05	7.6E-06	9.4E-07	8.5E-06	3.1E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	8.1E-04	3.9E-09a	8.1E-04	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	2.4E-01*	0.0E+00	2.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	8.3E-08
ISODRIN	5.8E+02	9.9E+07	5.8E+02	4.0E-05	2.3E-10	4.0E-05	7.9E-09
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-12
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	8.8E+05	5.1E+02	3.9E-04	2.3E-07	3.9E-04	1.4E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	9.2E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	6.8E-07
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.6E+00*	0.0E+00	2.6E+00*	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.7E-04	0.0E+00	5.7E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1c-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.4E+06	1.5E+00	3.1E-02	3.4E-08	3.1E-02	6.4E-07
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	8.1E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-07
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-06
CHLORDANE	2.0E+01	1.5E+08	2.0E+01	5.6E-03	7.4E-10	5.6E-03	3.9E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	9.2E-08
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.4E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	8.0E-11
PPDDE	7.4E+01	8.3E+07	7.4E+01	3.9E-03	3.5E-09	3.9E-03	3.2E-09
PPDDT	7.4E+01	1.8E+08	7.4E+01	1.4E-04	5.7E-11	1.4E-04	2.4E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-06
DIELDRIN	1.6E+00	6.3E+05	1.6E+00	1.3E+00*	3.2E-06	1.3E+00*	1.1E-09
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	5.3E+06	5.9E+05	7.6E-06	9.4E-07	8.5E-06	3.1E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	8.1E-04	3.9E-09a	8.1E-04	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	2.4E-01*	0.0E+00	2.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	8.3E-08
ISODRIN	5.8E+02	9.9E+07	5.8E+02	4.0E-05	2.3E-10	4.0E-05	7.9E-09
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-12
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	8.8E+05	5.1E+02	3.9E-04	2.3E-07	3.9E-04	1.4E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	9.2E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	6.8E-07
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.6E+00*	0.0E+00	2.6E+00*	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.7E-04	0.0E+00	5.7E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1c-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	9.1E+04	2.1E-01	2.3E-01*	5.2E-07	2.3E-01*	9.6E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	5.2E-13
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	7.3E-06
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	4.7E-05
CHLORDANE	2.7E+00	9.8E+06	2.7E+00	4.1E-02	1.1E-08	4.1E-02	5.9E-07
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-06
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-09
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	5.2E-10
PPDE	1.0E+01	5.5E+06	1.0E+01	2.8E-02	5.3E-08	2.8E-02	4.8E-08
PPDDT	1.0E+01	1.2E+07	1.0E+01	9.8E-04	8.6E-10	9.8E-04	3.6E-07
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-05
DIELDRIN	2.2E-01	4.2E+04	2.2E-01	9.2E+00*	4.8E-05	9.2E+00*	1.6E-08
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	4.5E+06	2.6E+05	1.8E-05	1.1E-06	1.9E-05	2.0E-07
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	1.9E-03	2.5E-08a	1.9E-03	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	5.6E-01*	0.0E+00	5.6E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	5.3E-07
ISODRIN	2.5E+02	1.5E+07	2.5E+02	9.3E-05	1.5E-09	9.3E-05	5.1E-08
MALATHION	7.3E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-11
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	7.1E+01	1.4E+05	7.1E+01	2.8E-03	1.5E-06	2.8E-03	2.1E-06
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	5.9E-10
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-05
ARSENIC	3.9E+00	0.0E+00	3.9E+00	1.4E+01*	0.0E+00	1.4E+01*	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	9.6E-04	0.0E+00	9.6E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1c-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	2.5E-02	3.7E-04	2.5E-02	1.1E-02
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-03
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-02
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.5E-03	8.1E-06	4.5E-03	6.9E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	2.3E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-03
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.9E-05
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-06
PPDDE	9.3E+01	1.9E+01	1.6E+01	3.1E-03	1.5E-02	1.8E-02	5.6E-05
PPDDT	9.3E+01	1.6E+04	9.2E+01	1.1E-04	6.2E-07	1.1E-04	4.2E-04
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-02
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+00*	3.5E-02	1.0E+00*	1.9E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	1.4E-05	3.1E-02	3.1E-02	1.6E-03
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	1.5E-03	1.3E-04a	1.6E-03	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	4.3E-01*	0.0E+00	4.3E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.4E-03
ISODRIN	3.2E+02	6.7E+01	5.5E+01	7.2E-05	3.4E-04	4.1E-04	4.2E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-07
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	6.5E+02	2.0E+03	4.9E+02	3.1E-04	9.9E-05	4.1E-04	2.4E-03
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	4.9E-06
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-05
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-02
ARSENIC	2.0E+01	0.0E+00	2.0E+01	2.9E+00*	0.0E+00	2.9E+00*	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.4E-03	0.0E+00	1.4E-03	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1c-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	1.8E+05	4.2E+01	1.2E-01	4.0E-01*	1.1E-03	4.0E-01*	4.8E-06	3.4E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	6.1E-13	4.3E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-06	2.6E-02
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-05	1.7E-01
CHLORDANE	1.5E+00	2.0E+07	5.2E+00	1.2E+00	7.2E-02	2.1E-02	9.4E-02	2.9E-07	2.1E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-08	2.3E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-07	4.9E-03
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-09	3.9E-05
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-10	4.2E-06
PPDDE	5.7E+00	1.1E+07	1.9E+01	4.4E+00	5.1E-02	1.5E-02	6.6E-02	2.4E-08	1.7E-04
PPDDT	5.7E+00	2.3E+07	5.4E+03	5.7E+00	1.7E-03	1.9E-06	1.7E-03	1.8E-07	1.3E-03
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-05	9.4E-02
DIELDRIN	1.2E-01	8.4E+04	1.9E+01	1.2E-01	1.6E+01*	1.0E-01*	1.6E+01*	8.0E-09	5.6E-05
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	7.1E+05	5.6E+02	5.6E+02	7.4E-05	8.9E-03	9.0E-03	2.3E-07	1.6E-03
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	7.9E-03	1.3E-04a	8.0E-03	0.0E+00	0.0E+00
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	2.3E+00*	0.0E+00	2.3E+00*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	6.2E-07	4.4E-03
ISODRIN	5.9E+01	1.3E+07	2.0E+02	4.6E+01	3.9E-04	1.1E-04	5.0E-04	6.0E-08	4.2E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-11	1.8E-07
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	4.1E+01	1.2E+05	2.0E+03	4.0E+01	4.9E-03	1.0E-04	5.0E-03	1.0E-06	7.2E-03
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	6.9E-10	4.9E-06
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-09	1.5E-05
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	5.1E-06	3.6E-02
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	3.5E+01*	0.0E+00	3.5E+01*	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	4.1E-03	0.0E+00	4.1E-03	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.4 SITE NCSA-1d: LIQUID STORAGE POOL (formerly Site 36-11: Liquid Storage Pond, ESE, 1987d/RIC 87133R01 and ESE, 1988d/RIC 87133R01A)

2.4.1 Site-Specific Considerations

Figure NCSA-1d-1 and Tables NCSA-1d-1 and NCSA-1d-2 depict the target contaminants for site NCSA-1d. Borings 3151, 3152, 3154 through 3158, 3379 through 3387, and 3491 were included in this exposure assessment, consistent with the North Central SAR.

According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-1d (ESE, 1987d/RIC 87133R01).

2.4.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1d are shown in Figure NCSA-1d-1. Table NCSA-1d-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1d-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.4.3 Site Exposure Summary

Tables NCSA-1d-3 through NCSA-1d-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1d is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

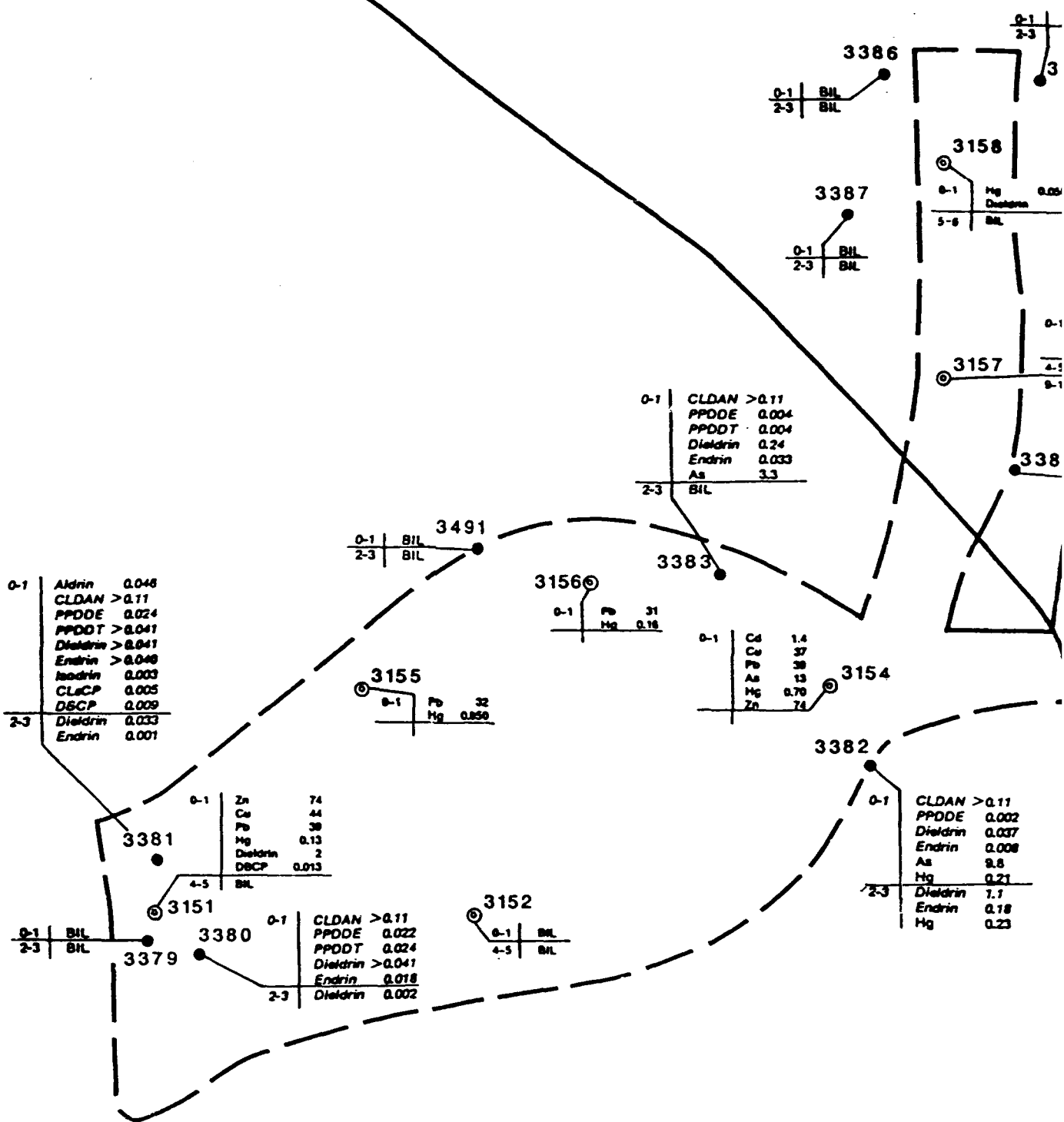
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
Aldrin	--	--	Direct	Indirect	Dir/Ind

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-1d is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

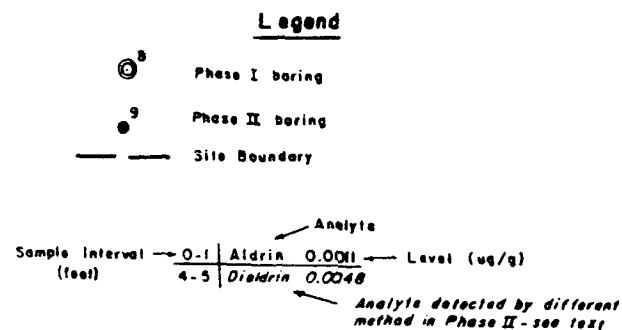
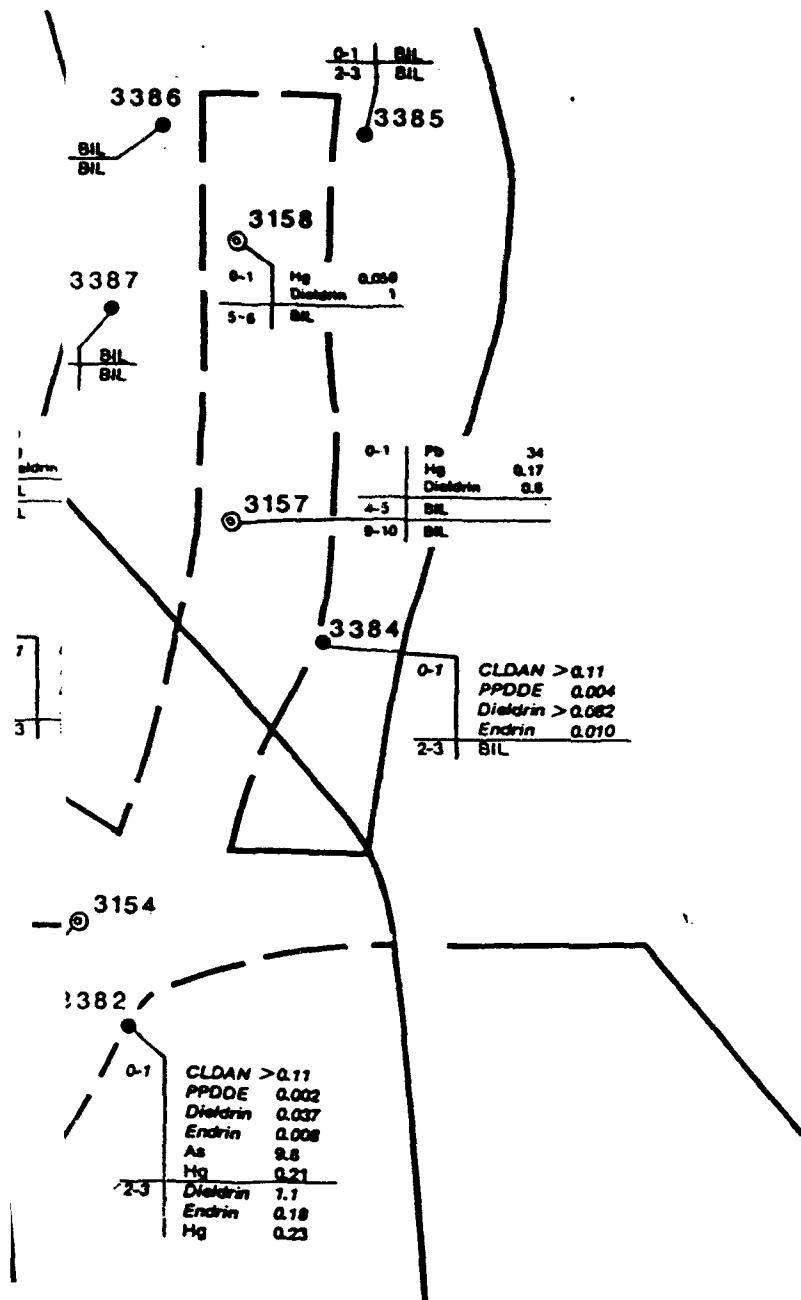
The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Methylene chloride (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Chloroform (enclosed)
- Benzene (enclosed)
- Chlorobenzene (enclosed)

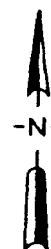


(1)

(2)



- BIL - Below indicator level
- CLDAN - Chlordane
- PPDE - 2,2-bis(Para-chlorophenyl)-1,1-dichloroethane
- PPDT - 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane
- DACP - Dithionochloropropene
- CLACP - Hexachlorocyclopentadiene
- As - Arsenic
- Cd - Cadmium
- Cu - Copper
- Pb - Lead
- Hg - Mercury
- Zn - Zinc



0 100
FEET

3

Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

Source: HLA, 1988

FIGURE NCSA-Id-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by: Ebasco Services Incorporated

TABLE NCSA-1d-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1d

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	0.046	0-1	3381	0.046	0-1	3381
Chlordane	>0.11	0-1	3380	>0.11	0-1	3380
		0-1	3381		0-1	3381
		0-1	3382		0-1	3382
		0-1	3383		0-1	3383
		0-1	3384		0-1	3384
PPDDE ^{1/}	0.024	0-1	3381	0.024	0-1	3381
PPDDT ^{2/}	>0.041	0-1	3381	>0.041	0-1	3381
Dibromochloropropane	0.013	0-1	3151	0.013	0-1	3151
Dieldrin	2	0-1	3151	2	0-1	3151
Endrin	0.18	2-3	3382	0.18	2-3	3382
Hexachlorocyclopentadiene	0.005	0-1	3381	0.005	0-1	3381
Isodrin	0.003	0-1	3381	0.003	0-1	3381
Arsenic	13	0-1	3154	--	--	--
Copper	44	0-1	3151	--	--	--
Mercury	0.70	0-1	3154	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene
2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-1d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1d
AVERAGE SITE DEPTH TO GROUNDWATER: 16 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	88	36076	02/8/88
1,1,2-TRICHLOROETHANE	3.6	36076	02/8/88
1,1-DICHLOROETHYLENE	2.0	36076	02/8/88
1,1-DICHLOROETHANE	6.3	36076	02/8/88
1,2-DICHLOROETHYLENE	9.0	36076	02/8/88
ALDRIN	0.70	36076	01/6/89
ATRAZINE	34	36076	01/6/89
BENZENE	12000	36076	01/6/89
METHYLENE CHLORIDE	33000	36076	01/6/89
CHLOROFORM	30000	36076	01/6/89
CHLOROBENZENE	26000	36076	02/8/88
CHLORDANE	5.7	36076	01/6/89
CHLOROPHENYLMETHYL SULFIDE	25	36076	01/6/89
CHLOROPHENYLMETHYL SULFONE	1300	36076	01/6/89
DIBROMOCHLOROPROPANE	0.44	36076	02/8/88
VAPONA	3.0	36076	01/6/89
DIISOPROPYLMETHYL PHOSPHONATE	1.4	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1d-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1d

AVERAGE SITE DEPTH TO GROUNDWATER: 16 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
DITHIANE	GT 160	36076	02/8/88
DIELDRIN	0.33	36076	01/6/89
DIMETHYL DISULFIDE	2.6	36076	01/6/89
DIMETHYLMETHYL PHOSPHONATE	1.7	36076	01/6/89
ENDRIN	0.25	36076	01/6/89
ISODRIN	0.55	36076	01/6/89
METHYLISSOBUTYL KETONE	20	36076	02/8/88
MALATHION	5.6	36076	01/6/89
1,4-OXATHIANE	54	36076	01/6/89
PPDDE	0.17	36076	01/6/89
PPDDT	0.98	36076	01/6/89
PARATHION	4.1	36076	01/6/89
SUPONA	2.9	36076	01/6/89
TETRACHLOROETHYLENE	3.4	36076	02/8/88
TRICHLOROETHYLENE	18	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1d-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.8E+05	1.5E+00	3.1E-02	2.6E-07	3.1E-02	1.0E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-02
CHLORDANE	2.0E+01	1.9E+07	2.0E+01	5.6E-03	5.8E-09	5.6E-03	3.9E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-04
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.2E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.8E-09
PPDDE	7.4E+01	1.1E+07	7.4E+01	3.3E-04	2.3E-09	3.3E-04	2.3E-08
PPDDT	7.4E+01	2.2E+07	7.4E+01	5.6E-04	1.8E-09	5.6E-04	9.8E-07
DIBROMOCHLOROPROPANE	1.8E+01	4.4E+02	1.7E+01	7.2E-04	2.9E-05	7.5E-04	1.6E-06
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.2E-09
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	8.1E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.6E+00	8.0E+04	1.6E+00	1.3E+00*	2.5E-05	1.3E+00*	1.4E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-11
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	6.5E+07	2.5E+03	7.3E-05	2.8E-09	7.3E-05	2.5E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	5.4E+03	4.0E+03	3.0E-07	9.3E-07	1.2E-06	0.0E+00
ISODRIN	5.8E+02	1.3E+07	5.8E+02	5.2E-06	2.4E-10	5.2E-06	3.3E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-13
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-09
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-02
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.9E-12
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-13
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-06
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	9.7E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-06
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-09
ARSENIC	2.2E+01	0.0E+00	2.2E+01	6.0E-01*	0.0E+00	6.0E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.1E-04	0.0E+00	2.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1d-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.8E+05	1.5E+00	3.1E-02	2.6E-07	3.1E-02	1.0E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-02
CHLORDANE	2.0E+01	1.9E+07	2.0E+01	5.6E-03	5.8E-09	5.6E-03	3.9E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-04
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.2E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.8E-09
PPDDE	7.4E+01	1.1E+07	7.4E+01	3.3E-04	2.3E-09	3.3E-04	2.3E-08
PPDDT	7.4E+01	2.2E+07	7.4E+01	5.6E-04	1.8E-09	5.6E-04	9.8E-07
DIBROMOCHLOROPROPANE	1.8E+01	4.4E+02	1.7E+01	7.2E-04	2.9E-05	7.5E-04	1.6E-06
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.2E-09
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	8.1E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.6E+00	8.0E+04	1.6E+00	1.3E+00*	2.5E-05	1.3E+00*	1.4E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-11
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	6.5E+07	2.5E+03	7.3E-05	2.8E-09	7.3E-05	2.5E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	5.4E+03	4.0E+03	3.0E-07	9.3E-07	1.2E-06	0.0E+00
ISODRIN	5.8E+02	1.3E+07	5.8E+02	5.2E-06	2.4E-10	5.2E-06	3.3E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-13
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-09
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-02
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.9E-12
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-13
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-06
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	9.7E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-06
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-09
ARSENIC	2.2E+01	0.0E+00	2.2E+01	6.0E-01*	0.0E+00	6.0E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.1E-04	0.0E+00	2.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1d-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.2E+04	2.1E-01	2.2E-01*	3.9E-06	2.2E-01*	1.6E-05
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-12
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-01
CHLORDANE	2.7E+00	1.3E+06	2.7E+00	4.1E-02	8.7E-08	4.1E-02	5.9E-06
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-03
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-01
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.3E-08
PPDDE	1.0E+01	7.0E+05	1.0E+01	2.4E-03	3.4E-08	2.4E-03	3.5E-07
PPDDT	1.0E+01	1.5E+06	1.0E+01	4.0E-03	2.8E-08	4.0E-03	1.5E-05
DIBROMOCHLOROPROPANE	2.5E+00	6.9E+01	2.4E+00	5.2E-03	1.9E-04	5.4E-03	2.5E-05
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	4.8E-08
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-02
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	2.2E-01	5.3E+03	2.2E-01	9.2E+00*	3.8E-04	9.2E+00*	2.1E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.7E-10
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-07
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+07	1.1E+03	1.7E-04	1.8E-08	1.7E-04	1.6E-10
HEXACHLOROCYCLOPENTADIENE	5.7E+03	1.9E+03	1.4E+03	8.8E-07	2.6E-06	3.5E-06	0.0E+00
ISODRIN	2.5E+02	2.0E+06	2.5E+02	1.2E-05	1.5E-09	1.2E-05	2.1E-07
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-12
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-08
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-01
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	5.1E-11
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-12
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-05
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	6.3E-07
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	3.9E-05
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	4.3E-04
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-08
ARSENIC	3.9E+00	0.0E+00	3.9E+00	3.3E+00*	0.0E+00	3.3E+00*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	1.8E-04	0.0E+00	1.8E-04	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	3.5E-04	0.0E+00	3.5E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1d-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	2.4E-02	1.2E-01*	1.4E-01*	3.6E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	7.5E+01
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.5E-03	8.1E-06	4.5E-03	1.3E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	4.2E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-04
PPDDE	9.3E+01	1.9E+01	1.6E+01	2.6E-04	1.2E-03	1.5E-03	8.0E-05
PPDDT	9.3E+01	1.9E+01	1.6E+01	4.4E-04	2.1E-03	2.5E-03	3.4E-03
DIBROMOCHLOROPROPANE	2.3E+01	4.8E+00	3.9E+00	5.7E-04	2.7E-03	3.3E-03	5.7E-03
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-05
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	2.8E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+00*	3.5E-02	1.0E+00*	4.7E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-07
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	2.9E+02	2.4E+02	1.3E-04	6.3E-04	7.6E-04	2.6E-07
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.9E+01	1.9E+01	9.2E-07	2.6E-04	2.6E-04	0.0E+00
ISODRIN	3.2E+02	6.7E+01	5.5E+01	9.4E-06	4.5E-05	5.4E-05	3.4E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-09
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-05
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	4.1E+01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	8.2E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	9.6E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-03
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	8.8E-03
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-02
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-06
ARSENIC	2.0E+01	0.0E+00	2.0E+01	6.5E-01*	0.0E+00	6.5E-01*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	2.5E-04	0.0E+00	2.5E-04	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	5.0E-04	0.0E+00	5.0E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-1d-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	2.3E+04	4.0E-01	9.0E-02	4.0E-01*	1.2E-01*	5.1E-01*	7.8E-06	1.1E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-12	2.1E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-01	2.3E+02
CHLORDANE	1.5E+00	2.5E+06	5.2E+00	1.2E+00	7.2E-02	2.1E-02	9.4E-02	2.9E-06	4.0E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-03	4.2E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.1E-02	8.4E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-07	1.6E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.4E-08	1.0E-04
PPDDE	5.7E+00	1.4E+06	1.9E+01	4.4E+00	4.2E-03	1.2E-03	5.4E-03	1.7E-07	2.4E-04
PPDDT	5.7E+00	3.0E+06	1.9E+01	4.4E+00	7.2E-03	2.1E-03	9.3E-03	7.4E-06	1.0E-02
DIBROMOCHLOROPROPANE	1.4E+00	5.9E+01	4.8E+00	1.1E+00	9.3E-03	2.9E-03	1.2E-02	1.2E-05	1.7E-02
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-08	3.3E-05
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-03	8.3E+00
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	1.1E+04	1.9E+01	1.2E-01	1.6E+01*	1.0E-01*	1.6E+01*	1.0E-07	1.4E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-10	5.9E-07
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	3.3E-07	4.5E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	8.7E+06	8.6E+02	2.0E+02	7.1E-04	2.1E-04	9.2E-04	1.9E-10	2.6E-07
HEXACHLOROCYCLOPENTADIENE	3.8E+02	7.1E+02	5.8E+01	4.7E+01	1.3E-05	9.4E-05	1.1E-04	0.0E+00	0.0E+00
ISODRIN	5.9E+01	1.7E+06	2.0E+02	4.6E+01	5.1E-05	1.5E-05	6.6E-05	2.5E-07	3.4E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-12	4.8E-09
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-08	2.4E-05
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	9.0E-02	1.2E+02
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	5.9E-11	8.2E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-12	1.9E-09
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-05	2.9E-02
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-07	1.0E-03
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-05	2.6E-02
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-04	3.0E-01
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-08	2.1E-05
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	8.1E+00*	0.0E+00	8.1E+00*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	7.7E-04	0.0E+00	7.7E-04	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	1.5E-03	0.0E+00	1.5E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.5 SITE NCSA-1e: BURN SITE (formerly Site 36-15: Burning Site, ESE, 1987e/RIC 87203R03 and ESE, 1988e/RIC 87203R03A)

2.5.1 Site-Specific Considerations

Figure NCSA-1e-1 and Tables NCSA-1e-1 and NCSA-1e-2 depict the target contaminants for site NCSA-1e. Borings 3191 through 3198 and 3560 through 3567 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-1e (ESE, 1987e/RIC 87203R03).

2.5.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1e are shown in Figure NCSA-1e-1. The following contaminants were not included in the figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Tetrachlorobenzene, occurring in Boring 3565 (4-5 ft), and methylphosphonic acid, occurring in Boring 3565 (4-5 ft). Although not shown on this figure, these nontarget compounds were included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO 1988a/RIC 88357R01).

Table NCSA-1e-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1e-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.5.3 Site Exposure Summary

Tables NCSA-1e-3 through NCSA-1e-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1e is greater than 10 ft,

the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Chlordane	Direct	Direct	Direct	Direct	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
Chromium	Direct	Direct	Direct	Direct	Direct
Cadmium	--	--	Direct	--	Direct
Lead	--	--	--	--	Direct
Mercury	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-1e is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants appear to result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

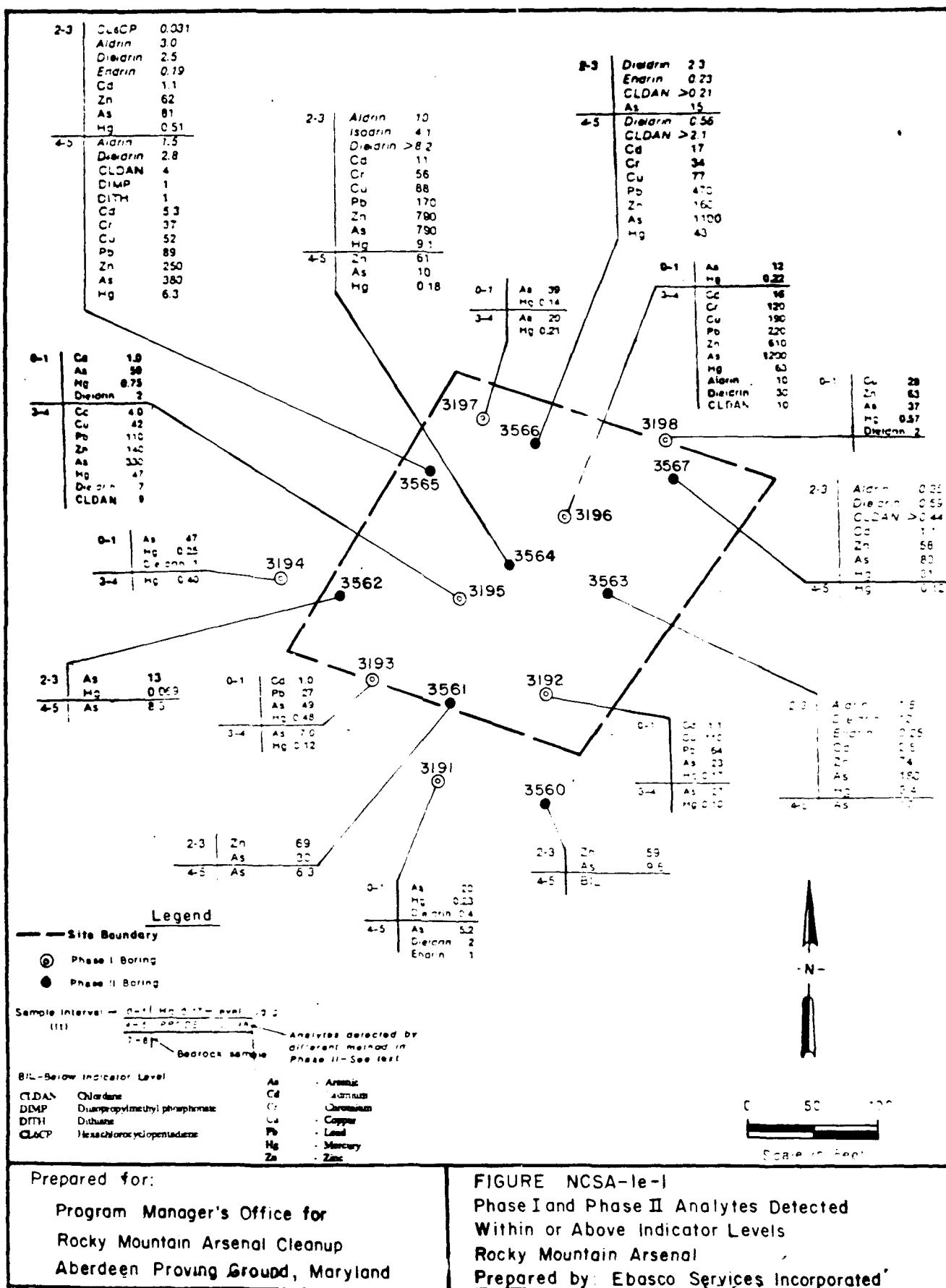


TABLE NCSA-1e-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1e

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	10	2-3	3564	10	2-3	3564
Chlordane		3-4	3196		3-4	3196
Dieldrin	10	3-4	3196	10	3-4	3196
Diisopropylmethyl phosphonate	30	3-4	3196	30	3-4	3196
Dithiane	1	4-5	3565	1	4-5	3565
Endrin	1	4-5	3565	1	4-5	3565
Hexachlorocyclopentadiene	1	4-5	3191	1	4-5	3191
Isodrin	0.031	2-3	3565	0.031	2-3	3565
Methyl phosphonic acid ^{1/}	4.1	2-3	3564	4.1	2-3	3564
Tetrachlorobenzene ^{1/}	290	4-5	3565	290	4-5	3565
Arsenic	5.0	4-5	3565	5.0	4-5	3565
Cadmium	1200	3-4	3196	--	--	--
Chromium	17	4-5	3566	--	--	--
Copper	120	3-4	3196	--	--	--
Lead	190	3-4	3196	--	--	--
Mercury	470	4-5	3566	--	--	--
Zinc	63	3-4	3196	--	--	--
	790	2-3	3564	--	--	--

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-1e-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1e

AVERAGE SITE DEPTH TO GROUNDWATER: 14 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,2-DICHLOROETHANE	1.7	36085	02/8/88
DIISOPROPYLMETHYL PHOSPHONATE	90	36085	02/8/88
DITHIANE	140	36085	02/8/88
DIELDRIN	0.34	36085	02/8/88
ENDRIN	0.17	36085	02/8/88
1,4-OXATHIANE	11	36085	02/8/88
TRICHLOROETHYLENE	0.68	36085	02/8/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1e-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	2.3E+06	1.5E+00	6.7E+00*	4.4E-06	6.7E+00*	0.0E+00
CHLORDANE	2.0E+01	4.5E+08	2.0E+01	5.1E-01*	2.2E-08	5.1E-01*	0.0E+00
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.9E+01*	3.7E-04a	1.9E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	6.5E+06	6.0E+05	1.5E-06	1.5E-07	1.7E-06	4.3E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	1.2E-05	0.0E+00	1.2E-05	0.0E+00
ENDRIN	2.5E+03	8.8E+08	2.5E+03	4.0E-04	1.1E-09	4.0E-04	1.9E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	2.2E+03	2.0E+03	1.9E-06	1.4E-05	1.6E-05	0.0E+00
ISODRIN	5.8E+02	1.3E+07	5.8E+02	7.1E-03	3.2E-07	7.1E-03	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-06
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E+01*	0.0E+00	5.6E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	3.8E-02	0.0E+00	3.8E-02	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	1.7E+00*	0.0E+00	1.7E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	4.5E-04	0.0E+00	4.5E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	3.0E-02	0.0E+00	3.0E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.9E-02	0.0E+00	1.9E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.0E-04	0.0E+00	4.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1e-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	2.3E+06	1.5E+00	6.7E+00*	4.4E-06	6.7E+00*	0.0E+00
CHLORDANE	2.0E+01	4.5E+08	2.0E+01	5.1E-01*	2.2E-08	5.1E-01*	0.0E+00
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.9E+01*	3.7E-04a	1.9E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	6.5E+06	6.0E+05	1.5E-06	1.5E-07	1.7E-06	4.3E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	1.2E-05	0.0E+00	1.2E-05	0.0E+00
ENDRIN	2.5E+03	8.8E+08	2.5E+03	4.0E-04	1.1E-09	4.0E-04	1.9E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	2.2E+03	2.0E+03	1.9E-06	1.4E-05	1.6E-05	0.0E+00
ISODRIN	5.8E+02	1.3E+07	5.8E+02	7.1E-03	3.2E-07	7.1E-03	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-06
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E+01*	0.0E+00	5.6E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	3.8E-02	0.0E+00	3.8E-02	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	1.7E+00*	0.0E+00	1.7E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	4.5E-04	0.0E+00	4.5E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	3.0E-02	0.0E+00	3.0E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.9E-02	0.0E+00	1.9E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.0E-04	0.0E+00	4.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1e-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.5E+05	2.1E-01	4.8E+01*	6.6E-05	4.8E+01*	0.0E+00
CHLORDANE	2.7E+00	3.0E+07	2.7E+00	3.7E+00*	3.3E-07	3.7E+00*	0.0E+00
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-05
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	1.4E+02*	5.6E-03a	1.4E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	2.3E+06	2.5E+05	3.6E-06	4.3E-07	4.0E-06	2.8E-08
DITHIANE	3.5E+04	0.0E+00	3.5E+04	2.8E-05	0.0E+00	2.8E-05	0.0E+00
ENDRIN	1.1E+03	1.4E+08	1.1E+03	9.5E-04	7.3E-09	9.5E-04	1.2E-10
HEXACHLOROCYCLOPENTADIENE	5.7E+03	8.0E+02	7.0E+02	5.5E-06	3.9E-05	4.4E-05	0.0E+00
ISODRIN	2.5E+02	2.0E+06	2.5E+02	1.7E-02	2.1E-06	1.7E-02	0.0E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-05
ARSENIC	3.9E+00	0.0E+00	3.9E+00	3.0E+02*	0.0E+00	3.0E+02*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	2.9E-01*	0.0E+00	2.9E-01*	0.0E+00
CHROMIUM	8.8E+00	0.0E+00	8.8E+00	1.4E+01*	0.0E+00	1.4E+01*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	7.6E-04	0.0E+00	7.6E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	5.1E-02	0.0E+00	5.1E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	3.2E-02	0.0E+00	3.2E-02	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	7.5E-04	0.0E+00	7.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1e-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	5.3E+00*	2.5E+01*	3.1E+01*	0.0E+00
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.0E-01*	7.4E-04	4.1E-01*	0.0E+00
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	8.7E-03
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.5E+01*	5.2E-01*	1.6E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	7.7E+04	6.3E+04	2.7E-06	1.3E-05	1.6E-05	5.6E-05
DITHIANE	4.6E+04	0.0E+00	4.6E+04	2.2E-05	0.0E+00	2.2E-05	0.0E+00
ENDRIN	1.4E+03	2.9E+02	2.4E+02	7.3E-04	3.5E-03	4.2E-03	2.5E-07
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.9E+01	1.9E+01	5.7E-06	1.6E-03	1.6E-03	0.0E+00
ISODRIN	3.2E+02	6.7E+01	5.5E+01	1.3E-02	6.1E-02	7.4E-02	0.0E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	5.4E-03
ARSENIC	2.0E+01	0.0E+00	2.0E+01	6.0E+01*	0.0E+00	6.0E+01*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	4.7E-02	0.0E+00	4.7E-02	0.0E+00
CHROMIUM	5.5E+01	0.0E+00	5.5E+01	2.2E+00*	0.0E+00	2.2E+00*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	1.1E-03	0.0E+00	1.1E-03	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	7.2E-02	0.0E+00	7.2E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	4.5E-02	0.0E+00	4.5E-02	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.0E-03	0.0E+00	1.0E-03	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-1e-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	3.1E+05	4.0E-01	9.0E-02	8.6E+01*	2.5E+01*	1.1E+02*	0.0E+00	0.0E+00
CHLORDANE	1.5E+00	6.1E+07	5.2E+00	1.2E+00	6.6E+00*	1.9E+00*	8.5E+00*	0.0E+00	0.0E+00
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-05	2.6E-02
DIELDRIN	1.2E-01	1.1E+04	1.9E+01	1.2E-01	2.5E+02*	1.6E+00*	2.5E+02*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	8.7E+05	2.3E+05	4.9E+04	1.5E-05	5.5E-06	2.0E-05	3.2E-08	5.6E-05
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	1.2E-04	0.0E+00	1.2E-04	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.2E+08	8.6E+02	2.0E+02	3.9E-03	1.2E-03	5.1E-03	1.4E-10	2.5E-07
HEXACHLOROCYCLOPENTADIENE	3.8E+02	3.0E+02	5.8E+01	4.3E+01	8.1E-05	6.4E-04	7.2E-04	0.0E+00	0.0E+00
ISODRIN	5.9E+01	1.7E+06	2.0E+02	4.6E+01	6.9E-02	2.0E-02	9.0E-02	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-06	1.6E-02
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	7.4E+02*	0.0E+00	7.4E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	2.2E+00*	0.0E+00	2.2E+00*	0.0E+00	0.0E+00
CHROMIUM	1.1E+00	0.0E+00	0.0E+00	1.1E+00	1.0E+02*	0.0E+00	1.0E+02*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	3.3E-03	0.0E+00	3.3E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	2.1E-01*	0.0E+00	2.1E-01*	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	1.4E-01*	0.0E+00	1.4E-01*	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	5.7E-03	0.0E+00	5.7E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.6 SITE NCSA-1f: SOUTH PLANTS DRAINAGE DITCHES (formerly Site 36-8: Chemical Drainage Ditch; ESE, 1987c/RIC 87113R01; Site 36-21: Drainage Ditch; ESE, 1987f/RIC 87133R03)

2.6.1 Site-Specific Considerations

Figure NCSA-1f-1 and Tables NCSA-1f-1 and NCSA-1f-2 depict the target contaminants for site NCSA-1f. Borings 3188 through 3190, 3261, 3262, and 3370 through 3375 from Site 36-21, and 3181, 3182, and 3388 through 3399 from Site 36-8 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-1f (ESE, 1987f/RIC 87133R03; ESE, 1987c/RIC 87113R01).

2.6.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-1f are shown in Figure NCSA-1f-1. The following contaminants were not included in the figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Methylphosphonic acid, occurring in Boring 3397 (9-10 ft), and pentachlorobenzene, occurring in Boring 3181 (0-1 ft). Although not shown on this figure, these nontarget compounds were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-1f-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1f-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.6.3 Site Exposure Summary

Tables NCSA-1f-3 through NCSA-1f-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1f is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Fluoracetic acid	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
Aldrin	--	--	Direct	--	Direct
Cadmium	--	--	Direct	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-1f is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (open, enclosed)
- Chloroform (enclosed)
- Methylene chloride (enclosed)
- Chlorobenzene (enclosed)
- 1,1-Dichloroethylene (enclosed)

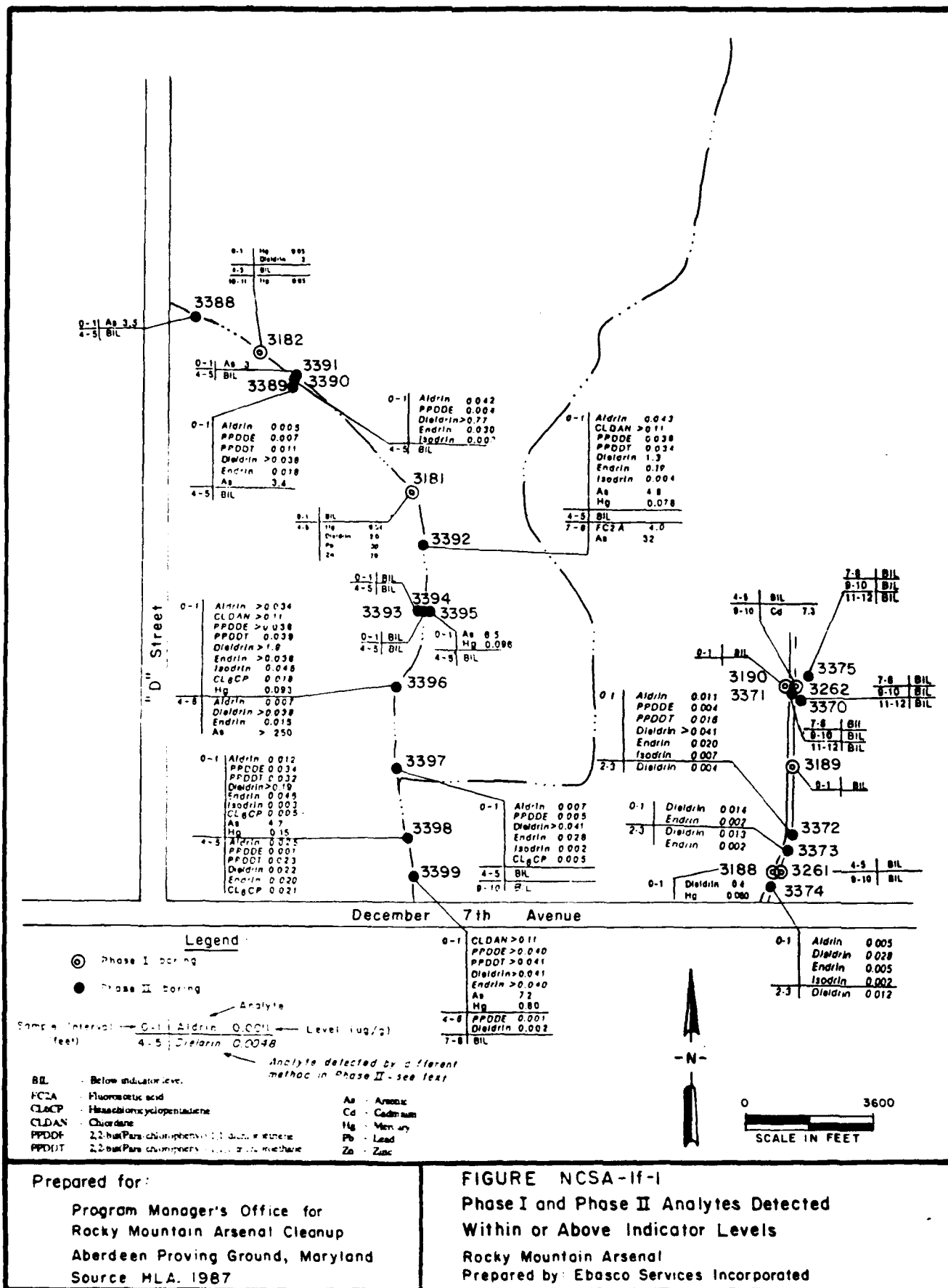


TABLE NCSA-1f-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1f

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	0.043	0-1	3392	0.043	0-1	3392
Chlordane	>0.11	0-1	3392	>0.11	0-1	3392
		0-1	3396		0-1	3396
		0-1	3399		0-1	3399
PPDDE ^{1/}	>0.040	0-1	3399	>0.040	0-1	3399
PPDDT ^{2/}	>0.041	0-1	3399	>0.041	0-1	3399
Dieldrin	2	0-1	3182	2	0-1	3182
		4-5	3181		4-5	3181
Endrin	0.19	0-1	3392	0.19	0-1	3392
Fluoroacetic acid	4.0	7-8	3392	4.0	7-8	3392
Hexachlorocyclopentadiene	0.021	4-5	3398	0.021	4-5	3398
Isodrin	0.045	0-1	3396	0.045	0-1	3396
Methyl phosphonic acid ^{3/}	5.1	9-10	3397	5.1	9-10	3397
Pentachlorobenzene ^{3/}	0.50	0-1	3181	0.50	0-1	3181
Arsenic	>250	4-5	3396	--	--	--
Cadmium	7.3	9-10	3262	--	--	--
Mercury	0.80	0-1	3399	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-1f-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1f
AVERAGE SITE DEPTH TO GROUNDWATER: 16 Feet

CHEMICAL	CONCENTRATION MAXIMUM	ATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	88	36076	02/8/88
1,1,2-TRICHLOROETHANE	3.6	36076	02/8/88
1,1-DICHLOROETHYLENE	2.0	36076	02/8/88
1,1-DICHLOROETHANE	6.3	36076	02/8/88
1,2-DICHLOROETHYLENE	9.0	36076	02/8/88
ALDRIN	0.70	36076	01/6/89
ATRAZINE	34	36076	01/6/89
BENZENE	12000	36076	01/6/89
METHYLENE CHLORIDE	33000	36076	01/6/89
CHLOROFORM	30000	36076	01/6/89
CHLOROBENZENE	26000	36076	02/8/88
CHLORDANE	5.7	36076	01/6/89
CHLOROPHENYLMETHYL SULFIDE	25	36076	01/6/89
CHLOROPHENYLMETHYL SULFONE	1300	36076	01/6/89
DIBROMOCHLOROPROPANE	0.44	36076	02/8/88
VAPONA	3.0	36076	01/6/89
DIISOPROPYLMETHYL PHOSPHONATE	1.4	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1f-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1f

AVERAGE SITE DEPTH TO GROUNDWATER: 16 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
DITHIANE	GT 160	36076	02/8/88
DIELDRIN	0.33	36076	01/6/89
DIMETHYL DISULFIDE	2.6	36076	01/6/89
DIMETHYLMETHYL PHOSPHONATE	1.7	36076	01/6/89
ENDRIN	0.25	36076	01/6/89
ISODRIN	0.55	36076	01/6/89
METHYLISOBUTYL KETONE	20	36076	02/8/88
MALATHION	5.6	36076	01/6/89
1,4-OXATHIANE	54	36076	01/6/89
PPDDE	0.17	36076	01/6/89
PPDDT	0.98	36076	01/6/89
PARATHION	4.1	36076	01/6/89
SUPONA	2.9	36076	01/6/89
TETRACHLOROETHYLENE	3.4	36076	02/8/88
TRICHLOROETHYLENE	18	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1f-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.8E+04	1.5E+00	2.9E-02	2.4E-06	2.9E-02	1.0E-05
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-12
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-01
CHLORDANE	2.0E+01	1.9E+06	2.0E+01	5.6E-03	5.7E-08	5.6E-03	3.8E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-03
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.1E-02
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.7E-08
PPDDE	7.4E+01	1.1E+06	7.4E+01	5.4E-04	3.7E-08	5.4E-04	2.3E-07
PPDDT	7.4E+01	2.3E+06	7.4E+01	5.6E-04	1.8E-08	5.6E-04	9.7E-06
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	8.0E-03
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.6E+00	8.1E+03	1.6E+00	1.3E+00*	2.5E-04	1.3E+00*	1.3E-07
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.6E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-07
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	6.6E+06	2.5E+03	7.7E-05	2.9E-08	7.7E-05	2.5E-10
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	1.0E-01*	0.0E+00	1.0E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	9.1E+01	9.0E+01	1.3E-06	2.3E-04	2.3E-04	0.0E+00
ISODRIN	5.8E+02	1.3E+06	5.8E+02	7.8E-05	3.5E-08	7.8E-05	3.3E-07
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-12
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-08
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-01
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-05
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	9.6E-07
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-05
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.8E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-08
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.2E+01*	0.0E+00	1.2E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.6E-02	0.0E+00	1.6E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.4E-04	0.0E+00	2.4E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1f-4

EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.8E+04	1.5E+00	2.9E-02	2.4E-06	2.9E-02	1.0E-05
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-12
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-01
CHLORDANE	2.0E+01	1.9E+06	2.0E+01	5.6E-03	5.7E-08	5.6E-03	3.8E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-03
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.1E-02
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.7E-08
PPDDE	7.4E+01	1.1E+06	7.4E+01	5.4E-04	3.7E-08	5.4E-04	2.3E-07
PPDDT	7.4E+01	2.3E+06	7.4E+01	5.6E-04	1.8E-08	5.6E-04	9.7E-06
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	8.0E-03
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.6E+00	8.1E+03	1.6E+00	1.3E+00*	2.5E-04	1.3E+00*	1.3E-07
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.6E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-07
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	6.6E+06	2.5E+03	7.7E-05	2.9E-08	7.7E-05	2.5E-10
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	1.0E-01*	0.0E+00	1.0E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	9.1E+01	9.0E+01	1.3E-06	2.3E-04	2.3E-04	0.0E+00
ISODRIN	5.8E+02	1.3E+06	5.8E+02	7.8E-05	3.5E-08	7.8E-05	3.3E-07
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-12
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-08
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-01
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-05
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	9.6E-07
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-05
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.8E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.0E-08
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.2E+01*	0.0E+00	1.2E+01*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.6E-02	0.0E+00	1.6E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.4E-04	0.0E+00	2.4E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1f-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.2E+03	2.1E-01	2.1E-01*	3.6E-05	2.1E-01*	1.5E-04
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-11
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	3.3E+00
CHLORDANE	2.7E+00	1.3E+05	2.7E+00	4.1E-02	8.6E-07	4.1E-02	5.8E-05
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-02
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E+00
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-06
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.3E-07
PPDDE	1.0E+01	7.1E+04	1.0E+01	3.9E-03	5.6E-07	3.9E-03	3.4E-06
PPDDT	1.0E+01	1.5E+05	1.0E+01	4.0E-03	2.7E-07	4.0E-03	1.5E-04
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-04
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	4.7E-07
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-01
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	2.2E-01	5.4E+02	2.2E-01	9.2E+00*	3.7E-03	9.2E+00*	2.0E-06
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.6E-09
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-06
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	1.8E-04	1.9E-07	1.8E-04	1.6E-09
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	2.4E-01*	0.0E+00	2.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	3.3E+01	3.3E+01	3.7E-06	6.4E-04	6.5E-04	0.0E+00
ISODRIN	2.5E+02	2.0E+05	2.5E+02	1.8E-04	2.3E-07	1.8E-04	2.1E-06
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-11
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-07
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	1.8E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	5.1E-10
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-11
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-04
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-06
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	3.8E-04
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	4.3E-03
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-07
ARSENIC	3.9E+00	0.0E+00	3.9E+00	6.3E+01*	0.0E+00	6.3E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	1.3E-01*	0.0E+00	1.3E-01*	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	4.1E-04	0.0E+00	4.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-1f-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	2.3E-02	3.4E-04	2.3E-02	3.6E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	7.5E+01
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.5E-03	8.1E-06	4.5E-03	1.3E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	4.2E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-04
PPDDE	9.3E+01	7.6E+03	9.2E+01	4.3E-04	5.3E-06	4.4E-04	8.0E-05
PPDDT	9.3E+01	1.6E+04	9.2E+01	4.4E-04	2.6E-06	4.4E-04	3.4E-03
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	5.7E-03
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-05
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	2.8E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+00*	3.5E-02	1.0E+00*	4.7E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-07
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.6E+04	1.3E+03	1.4E-04	1.2E-05	1.5E-04	2.6E-07
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	1.9E-01*	0.0E+00	1.9E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	2.8E-01	2.8E-01	3.9E-06	7.6E-02	7.6E-02	0.0E+00
ISODRIN	3.2E+02	6.7E+01	5.5E+01	1.4E-04	6.7E-04	8.1E-04	3.4E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-09
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-05
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	4.1E+01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	8.2E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	9.6E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-03
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	8.8E-03
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-02
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-06
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.3E+01*	0.0E+00	1.3E+01*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	2.0E-02	0.0E+00	2.0E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	5.7E-04	0.0E+00	5.7E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-1f-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	2.4E+03	4.2E+01	1.2E-01	3.7E-01*	1.0E-03	3.7E-01*	7.7E-05	1.1E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-11	2.1E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	1.6E+00	2.3E+02
CHLORDANE	1.5E+00	2.6E+05	5.2E+00	1.2E+00	7.2E-02	2.1E-02	9.4E-02	2.9E-05	4.0E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-02	4.2E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.1E-01	8.4E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-06	1.6E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-07	1.0E-04
PPDDE	5.7E+00	1.4E+05	2.5E+03	5.7E+00	7.0E-03	1.6E-05	7.0E-03	1.7E-06	2.4E-04
PPDDT	5.7E+00	3.0E+05	5.4E+03	5.7E+00	7.2E-03	7.8E-06	7.2E-03	7.3E-05	1.0E-02
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-04	1.7E-02
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-07	3.3E-05
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	6.0E-02	8.3E+00
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	1.1E+03	1.9E+01	1.2E-01	1.6E+01*	1.1E-01*	1.6E+01*	1.0E-06	1.4E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-09	5.9E-07
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-06	4.5E-04
DIMETHYMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	8.8E+05	1.6E+04	2.5E+02	7.5E-04	1.2E-05	7.6E-04	1.8E-09	2.6E-07
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	1.0E+00*	0.0E+00	1.0E+00*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	1.2E+01	8.3E-01	7.8E-01	5.5E-05	2.7E-02	2.7E-02	0.0E+00	0.0E+00
ISODRIN	5.9E+01	1.7E+05	2.0E+02	4.6E+01	7.6E-04	2.2E-04	9.8E-04	2.5E-06	3.4E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-11	4.8E-09
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-07	2.4E-05
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	8.9E-01	1.2E+02
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	5.9E-10	8.2E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-11	1.9E-09
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-04	2.9E-02
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	7.2E-06	1.0E-03
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-04	2.6E-02
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-03	3.0E-01
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-07	2.1E-05
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.5E+02*	0.0E+00	1.5E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	9.6E-01*	0.0E+00	9.6E-01*	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	1.7E-03	0.0E+00	1.7E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.7 SITE NCSA-1g: INFERRED SURFICIAL CONTAMINATION (formerly Site 36-5: Mercury Spill; ESE 1988cc/RIC 88063R01)

2.7.1 Site-Specific Considerations

Figure NCSA-1g-1 and Tables NCSA-1g-1 and NCSA-1g-2 depict the target contaminants for site NCSA-1g. Borings 3138, 3141, and 3142 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no analytes were detected above indicator levels (ESE, 1988cc/RIC 88063R01). Surficial contamination attributed to wind dispersion is inferred to exist at Site NCSA-1g (ESE, 1988cc/RIC 88063R01).

2.7.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of target contaminants that were detected in Site NCSA-1g are shown in Figure NCSA-1g-1. Table NCSA-1g-1 shows that no target contaminants were found above the indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-1g-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.7.3 Site Exposure Summary

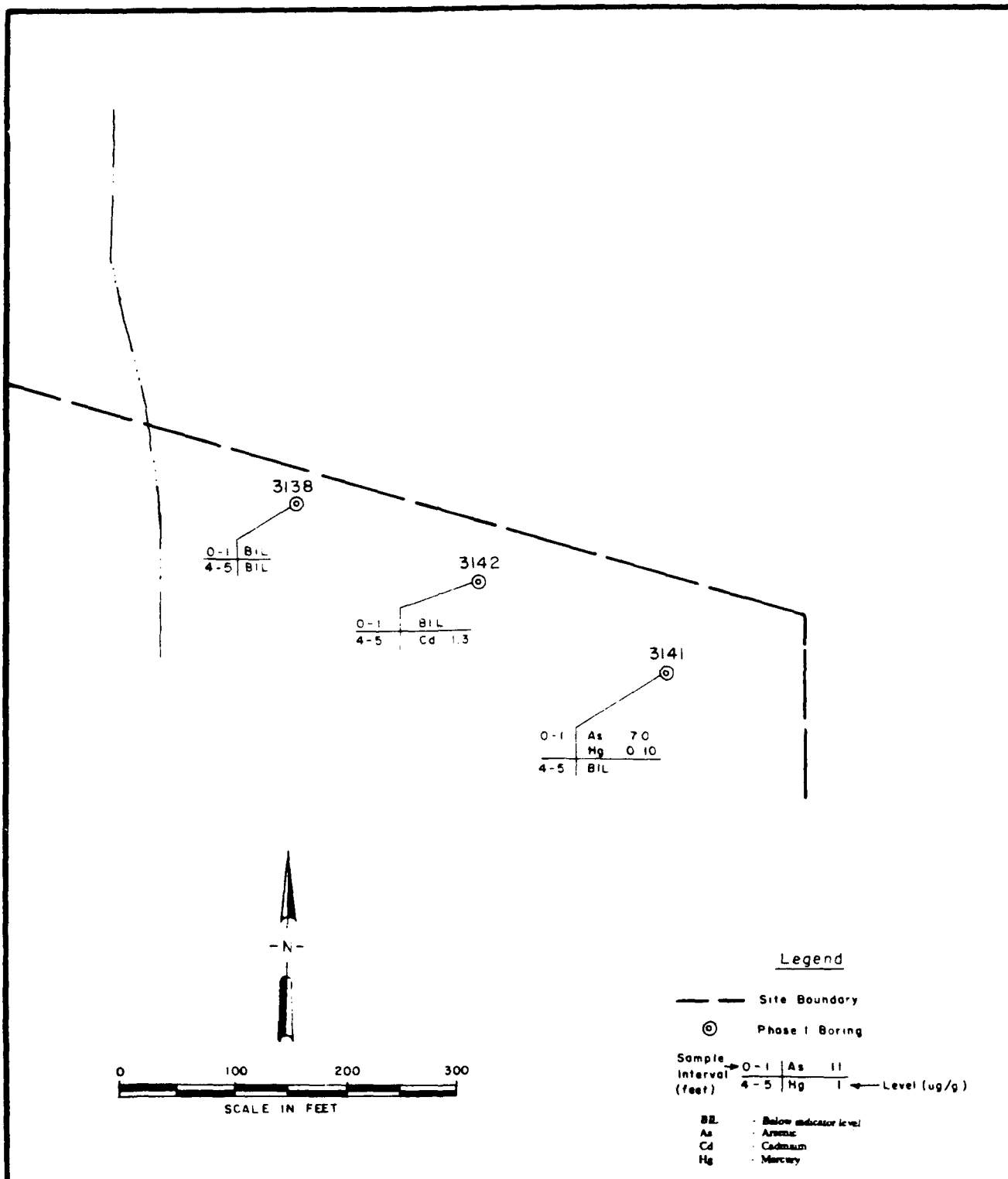
Tables NCSA-1g-3 through NCSA-1g-7 present Draft PPLVs and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-1g is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity.

No soil contaminants are shown on Table NCSA-1g-1, therefore, no COCs were identified for this site. Site NCSA-1g is designated as a Priority 2 site.

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (enclosed)

- Carbon tetrachloride (enclosed)
- Chlorobenzene (enclosed)
- Chloroform (enclosed)
- Dibromochloropropane (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Dicyclopentadiene (enclosed)
- Tetrachloroethylene (enclosed)
- Trichloroethylene (enclosed)



Prepared for:

Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland

FIGURE NCSA-1g-1

Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated

TABLE NCSA-1g-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-1g

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
None	--	--	--	--	--	--
NCSA Max. ug/g ft	North Central Study Area Maximum microgram per gram foot/feet					

TABLE NCSA-1g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1g

AVERAGE SITE DEPTH TO GROUNDWATER: 21 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	2200	36001	01/5/89
1,1,2-TRICHLOROETHANE	150	36181	05/10/88
1,1-DICHLOROETHYLENE	8.0	36001	02/11/88
1,1-DICHLOROETHANE	1.6	36181	05/10/88
1,2-DICHLOROETHYLENE	280	36181	01/5/89
M-XYLENE	510	36001	02/11/88
ALDRIN	6.3	36001	02/11/88
ATRAZINE	GT 180	36001	02/11/88
BICYCLOHEPTADIENE	390	36001	01/5/89
BENZOTHIAZOLE	6.6	36001	01/5/89
BENZENE	51000	36181	05/10/88
CARBON TETRACHLORIDE	540	36181	01/5/89
METHYLENE CHLORIDE	360	36001	01/5/89
CHLOROFORM	5100	36001	02/11/88
HEXACHLOROCYCLOPENTADIENE	4.4	36001	01/5/89
CHLOROBENZENE	70000	36181	05/10/88
CHLOROPHENYLMETHYL SULFIDE	110	36001	02/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1g
AVERAGE SITE DEPTH TO GROUNDWATER: 21 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROPHENYLMETHYL SULFOXIDE	3.7	36181	10/28/87
CHLOROPHENYLMETHYL SULFONE	130	36001	02/11/88
DIBROMOCHLOROPROPANE	GT 300	36001	01/5/89
DICYCLOPENTADIENE	92	36001	01/5/89
DIISOPROPYLMETHYL PHOSPHONATE	15	36181	01/5/89
DITHIANE	13	36001	02/11/88
DIELDRIN	1.2	36001	02/11/88
DIMETHYL DISULFIDE	67	36001	01/5/89
DIMETHYLMETHYL PHOSPHONATE	110	36181	10/28/87
ENDRIN	14	36001	01/5/89
ETHYLBENZENE	640	36001	02/11/88
TOLUENE	1300	36181	05/10/88
METHYLISOBUTYL KETONE	3500	36001	02/11/88
MALATHION	2.8	36001	01/5/89
1,4-OXATHIANE	16	36001	01/5/89
PARATHION	15	36001	01/5/89
SUPONA	18	36001	01/5/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-1g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-1g

AVERAGE SITE DEPTH TO GROUNDWATER: 21 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
TETRACHLOROETHYLENE	310	36001	01/5/89
TRICHLOROETHYLENE	7600	36181	05/10/88
O,P-XYLENE	1100	36181	05/10/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-1g-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-05
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-12
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-01
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	5.8E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	6.4E-06
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-02
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-03
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.9E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.1E-11
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-03
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-10
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-03
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	5.8E-04
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	7.1E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-09
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	9.2E-07
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-05
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.7E-13
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-07
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-04
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.1E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.7E-06
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-04
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-02
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.0E-06
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.2E-06

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

MCSA-1g-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-05
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-12
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-01
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	5.8E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	6.4E-06
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-02
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-03
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.9E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.1E-11
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-03
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-10
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-03
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	5.8E-04
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	7.1E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-09
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	9.2E-07
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-05
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.7E-13
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-07
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-04
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.1E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.7E-06
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-04
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-02
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.0E-06
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.2E-06

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1g-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	1.6E-04
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	8.1E-12
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.6E+00
BENZOTHIADIAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.7E-08
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	4.2E-05
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-01
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	8.0E-03
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-02
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	5.1E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	7.2E-09
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-10
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-02
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-08
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	5.6E-02
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-03
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	8.5E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-09
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	8.2E-06
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-08
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-06
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	5.0E-04
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-12
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-06
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-03
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-10
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	8.6E-12
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	4.3E-03
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	2.6E-06
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-05
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-03
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-01
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	6.4E-06
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	1.4E-05

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1g-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.7E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-02
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	1.8E+02
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-02
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	3.3E+01
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	6.4E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.7E+00
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	5.7E-06
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.2E-07
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.2E+00
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-06
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	6.4E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.0E+00
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	9.7E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	3.7E-06
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	6.6E-03
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	8.2E-06
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-03
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-01
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-09
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-03
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-07
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	2.1E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-02
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-01
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	2.4E+01
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	5.1E-03
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	1.1E-02

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-1g-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	8.0E-05	5.5E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	9.4E-12	6.5E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	7.9E-01	5.4E+02
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.3E-08	3.0E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-05	3.3E-02
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-01	9.9E+01
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-03	6.4E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-02	8.1E+00
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.9E-07	4.1E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	8.3E-09	5.7E-06
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.6E-10	3.2E-07
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-03	6.6E+00
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-09	4.8E-06
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-02	1.9E+01
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	4.4E-03	3.0E+00
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	4.2E-07	2.9E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-09	3.7E-06
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	9.6E-06	6.6E-03
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-08	8.2E-06
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	6.9E-06	4.7E-03
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	5.8E-04	4.0E-01
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-12	1.4E-09
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-06	2.4E-03
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-03	7.7E-01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.5E-10	1.7E-07
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-11	6.9E-09
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-03	1.5E+00
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	3.1E-06	2.1E-03
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-05	1.4E-02
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	8.9E-04	6.1E-01
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-01	7.1E+01
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	7.5E-06	5.1E-03
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-05	1.1E-02

2.8 SITE NCSA-2a: BASIN C (formerly Site 26-3; ESE, 1987g/RIC 87343R03 and ESE, 1988i/RIC 87343R03A)

2.8.1 Site-Specific Considerations

Figure NCSA-2a-1 and Tables NCSA-2a-1 and NCSA-2a-2 depict the target contaminants for site NCSA-2a. Borings 4503, 4510, 4515, 4520, 4550 through 4584, 4692, 4697, 4699, and 4708 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-2a (ESE, 1987g/RIC 87343R03).

2.8.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-2a are shown in Figure NCSA-2a-1. Methylphosphonic acid, occurring in Boring 4692 (4-5 ft) was not included in this figure, since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown on this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-2a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Methylene chloride, shown on Table NCSA-2a-1, is excluded from consideration in the exposure analysis for this site because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-2a-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.8.3 Site Exposure Summary

Tables NCSA-2a-3 through NCSA-2a-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-2a is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

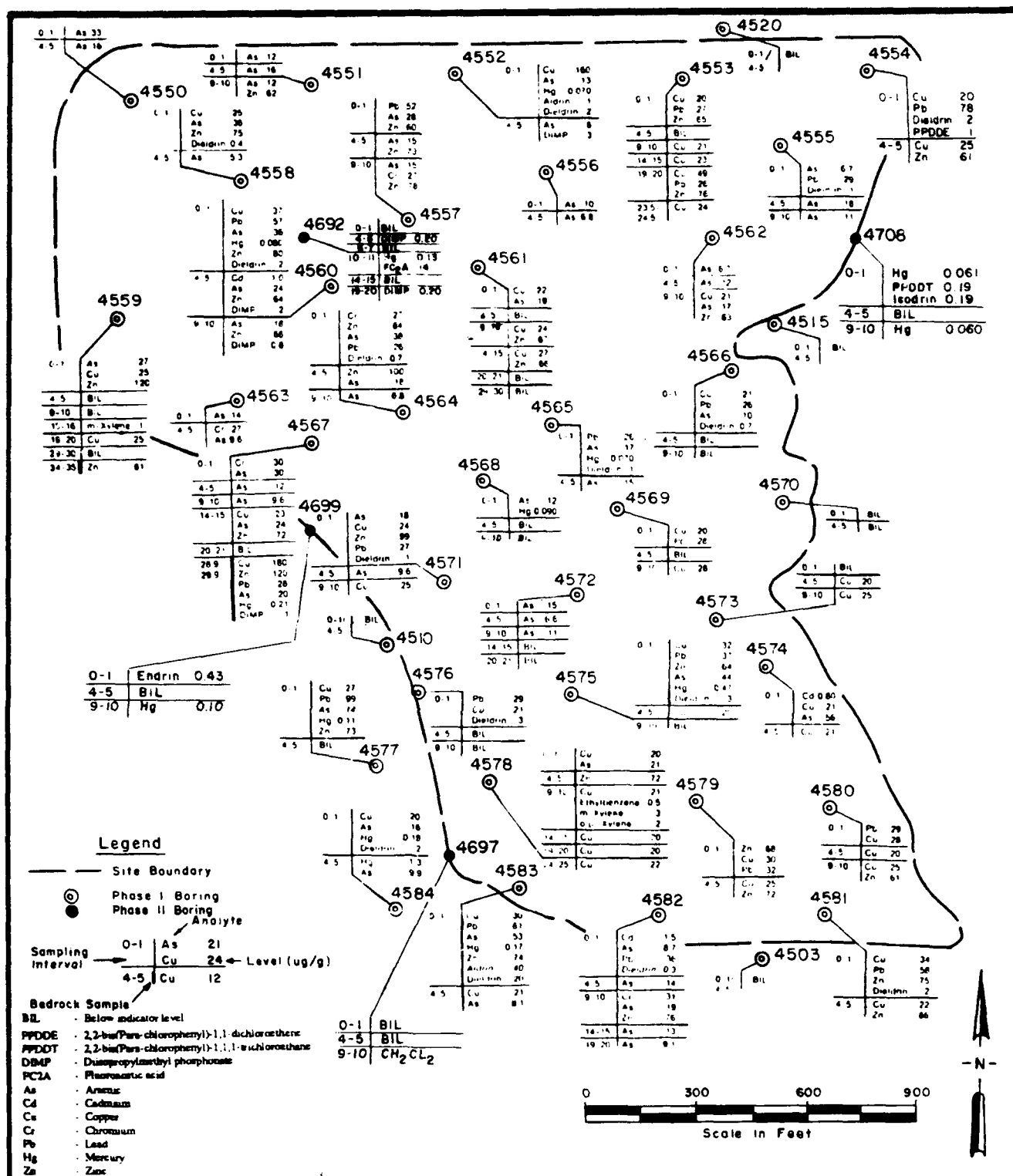
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
PPDDE	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-2a is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

Source: ESE, 1987

FIGURE NCSA-2a-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated

TABLE NCSA-2a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-2a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	40	0-1	4583	40	0-1	4583
PPDDE ^{1/}	1	0-1	4554	1	0-1	4554
PPDDT ^{2/}	0.19	0-1	4708	0.19	0-1	4708
Dieldrin	20	0-1	4583	20	0-1	4583
Diisopropylmethyl phosphonate	3	4-5	4552	3	4-5	4552
Endrin	0.43	0-1	4699	0.43	0-1	4699
Ethylbenzene	0.5	9-10	4578	0.5	9-10	4578
Fluoroacetic acid	--	--	--	14	10-11	4692
Isodrin	0.19	0-1	4708	0.19	0-1	4708
Methylene chloride ^{3/}	0.70	9-10	4697	0.70	9-10	4697
Methyl phosphonic acid ^{4/}	>400	4-5	4692	>400	4-5	4692
m-Xylene	3	9-10	4578	3	9-10	4578
o,p-Xylene	2	9-10	4578	2	9-10	4578
Arsenic	56	0-1	4574	--	--	--
Copper	160	0-1	4552	--	--	--
Lead	99	0-1	4577	--	--	--
Mercury	1.3	4-5	4584	--	--	--
Zinc	120	0-1	4559	--	--	--

- 1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene
2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane
3/ Suspected laboratory contaminant
4/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-2a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2a
AVERAGE SITE DEPTH TO GROUNDWATER: 36 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	0.83	26085	01/26/88
ALDRIN	4.6	26063	05/3/88
ATRAZINE	44	26085	02/16/89
BENZOTHAZOLE	14	26127	01/21/88
CHLOROFORM	24	26063	11/21/88
HEXACHLOROCYCLOPENTADIENE	0.12	26085	02/16/89
CHLOROBENZENE	3.7	26127	07/25/88
CHLORDANE	5.2	26085	02/16/89
CHLOROPHENYLMETHYL SULFOXIDE	35	26085	11/17/88
CHLOROPHENYLMETHYL SULFONE	24	26085	02/16/89
DIBROMOCHLOROPROPANE	0.18	26085	09/16/87
DICYCLOPENTADIENE	13	26127	01/21/88
VAPONA	1.2	26063	11/21/88
DIISOPROPYLMETHYL PHOSPHONATE	1600	26127	09/16/87
DITHIANE	100	26127	11/16/88
DIELDRIN	5.3	26127	07/25/88
DIMETHYLMETHYL PHOSPHONATE	5.9	26085	02/16/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-2a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2a

AVERAGE SITE DEPTH TO GROUNDWATER: 36 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ENDRIN	0.089	26127	02/10/89
ISODRIN	0.76	26085	02/16/89
TOLUENE	2.9	26127	11/16/88
1,4-OXATHIANE	7.7	26127	09/16/87
PPDDE	2.0	26085	01/26/88
PPDDT	2.4	26085	01/26/88
SUPONA	1.6	26085	02/16/89
TETRACHLOROETHYLENE	9.5	26127	01/21/88
TRICHLOROETHYLENE	13	26085	05/4/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-2a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.2E+05	1.5E+00	2.7E+01*	3.4E-04	2.7E+01*	4.6E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-13
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-09
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.4E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-10
PPDDE	7.4E+01	7.0E+06	7.4E+01	1.4E-02	1.4E-07	1.4E-02	1.9E-07
PPDDT	7.4E+01	1.5E+07	7.4E+01	2.6E-03	1.3E-08	2.6E-03	1.6E-06
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-07
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-05
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.3E+01*	3.8E-04a	1.3E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	5.0E+05	2.8E+05	4.5E-06	6.1E-06	1.1E-05	4.5E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.3E+07	2.5E+03	1.7E-04	1.0E-08	1.7E-04	6.0E-12
ETHYLBENZENE	8.3E+05	5.0E+06	7.1E+05	6.1E-07	1.0E-07	7.1E-07	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06
ISODRIN	5.8E+02	8.4E+06	5.8E+02	3.3E-04	2.3E-08	3.3E-04	3.1E-08
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	7.2E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-06
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	5.3E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	6.1E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	5.5E-10
M-XYLENE	1.4E+07	2.2E+06	1.9E+06	2.1E-07	1.4E-06	1.6E-06	0.0E+00
O,P-XYLENE	1.4E+07	4.3E+06	3.3E+06	1.4E-07	4.7E-07	6.1E-07	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.6E+00*	0.0E+00	2.6E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	3.8E-04	0.0E+00	3.8E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	6.4E-03	0.0E+00	6.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.2E+05	1.5E+00	2.7E+01*	3.4E-04	2.7E+01*	4.6E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-13
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-09
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.4E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-10
PPDDE	7.4E+01	7.0E+06	7.4E+01	1.4E-02	1.4E-07	1.4E-02	1.9E-07
PPDDT	7.4E+01	1.5E+07	7.4E+01	2.6E-03	1.3E-08	2.6E-03	1.6E-06
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-07
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-05
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.3E+01*	3.8E-04a	1.3E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	5.0E+05	2.8E+05	4.5E-06	6.1E-06	1.1E-05	4.5E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.3E+07	2.5E+03	1.7E-04	1.0E-08	1.7E-04	6.0E-12
ETHYLBENZENE	8.3E+05	5.0E+06	7.1E+05	6.1E-07	1.0E-07	7.1E-07	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06
ISODRIN	5.8E+02	8.4E+06	5.8E+02	3.3E-04	2.3E-08	3.3E-04	3.1E-08
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	7.2E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-06
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	5.3E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	6.1E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-05
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	5.5E-10
M-XYLENE	1.4E+07	2.2E+06	1.9E+06	2.1E-07	1.4E-06	1.6E-06	0.0E+00
O,P-XYLENE	1.4E+07	4.3E+06	3.3E+06	1.4E-07	4.7E-07	6.1E-07	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.6E+00*	0.0E+00	2.6E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	3.8E-04	0.0E+00	3.8E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	6.4E-03	0.0E+00	6.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2a-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	7.7E+03	2.1E-01	1.9E+02*	5.2E-03	1.9E+02*	7.0E-05
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-12
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-08
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	3.6E-06
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	6.7E-05
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	7.9E-10
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-09
PPDE	1.0E+01	4.6E+05	1.0E+01	9.8E-02	2.2E-06	9.8E-02	2.8E-06
PPDT	1.0E+01	9.8E+05	1.0E+01	1.9E-02	1.9E-07	1.9E-02	2.5E-05
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	6.9E-06
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-04
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	9.2E+01*	5.7E-03a	9.2E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	7.7E+04	6.0E+04	1.1E-05	3.9E-05	5.0E-05	2.9E-07
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	6.6E+06	1.1E+03	4.1E-04	6.5E-08	4.1E-04	3.9E-11
ETHYLBENZENE	3.5E+05	1.8E+06	2.9E+05	1.4E-06	2.8E-07	1.7E-06	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	8.3E-06
ISODRIN	2.5E+02	1.3E+06	2.5E+02	7.7E-04	1.5E-07	7.7E-04	2.0E-07
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	4.6E-13
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	7.9E-05
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	3.4E-09
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-04
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	8.3E-09
M-XYLENE	5.8E+06	8.0E+05	7.0E+05	5.2E-07	3.8E-06	4.3E-06	0.0E+00
O,P-XYLENE	5.8E+06	1.5E+06	1.2E+06	3.4E-07	1.3E-06	1.6E-06	0.0E+00
ARSENIC	3.9E+00	0.0E+00	3.9E+00	1.4E+01*	0.0E+00	1.4E+01*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	6.4E-04	0.0E+00	6.4E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.1E-02	0.0E+00	1.1E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	6.6E-04	0.0E+00	6.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.1E-04	0.0E+00	1.1E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2a-6

EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	2.1E+01*	1.0E+02*	1.2E+02*	5.8E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	6.9E-10
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	2.7E-05
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	5.6E-03
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.6E-07
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06
PPDDE	9.3E+01	1.9E+01	1.6E+01	1.1E-02	5.1E-02	6.2E-02	2.3E-04
PPDDT	9.3E+01	1.9E+01	1.6E+01	2.0E-03	9.8E-03	1.2E-02	2.0E-03
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	5.7E-04
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-01
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+01*	3.5E-01*	1.0E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	8.2E-06	1.8E-02	1.8E-02	1.7E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.6E+04	1.3E+03	3.1E-04	2.8E-05	3.4E-04	2.3E-08
ETHYLBENZENE	4.6E+05	6.0E+02	6.0E+02	1.1E-06	8.3E-04	8.4E-04	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.8E-03
ISODRIN	3.2E+02	6.7E+01	5.5E+01	5.9E-04	2.8E-03	3.4E-03	1.2E-04
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-03
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	2.0E-06
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-06
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-02
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-07
M-XYLENE	7.0E+06	2.7E+02	2.7E+02	4.3E-07	1.1E-02	1.1E-02	0.0E+00
O,P-XYLENE	7.0E+06	5.2E+02	5.2E+02	2.9E-07	3.9E-03	3.9E-03	0.0E+00
ARSENIC	2.0E+01	0.0E+00	2.0E+01	2.8E+00*	0.0E+00	2.8E+00*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	9.1E-04	0.0E+00	9.1E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.5E-02	0.0E+00	1.5E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	9.3E-04	0.0E+00	9.3E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.5E-04	0.0E+00	1.5E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	1.5E+04	4.0E-01	9.0E-02	3.4E+02*	1.0E+02*	4.4E+02*	3.5E-05	1.7E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-12	6.9E-10
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	5.4E-08	2.7E-05
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-06	9.0E-04
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-07	1.5E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-05	1.7E-02
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	9.1E-10	4.6E-07
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-09	1.3E-06
PPDDE	5.7E+00	9.3E+05	1.9E+01	4.4E+00	1.7E-01*	5.1E-02	2.3E-01*	1.4E-06	7.0E-04
PPDDT	5.7E+00	2.0E+06	1.9E+01	4.4E+00	3.3E-02	9.8E-03	4.3E-02	1.2E-05	6.1E-03
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-06	1.7E-03
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-04	1.8E-01
DIELDRIN	1.2E-01	7.1E+03	1.9E+01	1.2E-01	1.6E+02*	1.0E+00*	1.6E+02*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	6.6E+04	1.6E+02	1.6E+02	4.4E-05	1.8E-02	1.9E-02	3.4E-07	1.7E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	5.7E+06	1.6E+04	2.5E+02	1.7E-03	2.8E-05	1.7E-03	4.5E-11	2.3E-08
ETHYLBENZENE	8.5E+04	6.6E+05	1.8E+03	1.8E+03	5.9E-06	2.8E-04	2.8E-04	0.0E+00	0.0E+00
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	9.6E-06	4.8E-03
ISODRIN	5.9E+01	1.1E+06	2.0E+02	4.6E+01	3.2E-03	9.4E-04	4.2E-03	2.3E-07	1.2E-04
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	5.4E-13	2.7E-10
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	3.9E-05	2.0E-02
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-09	2.0E-06
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	4.6E-09	2.3E-06
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04	5.2E-02
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-09	2.1E-06
M-XYLENE	8.8E+05	2.9E+05	8.0E+02	7.9E+02	3.4E-06	3.8E-03	3.8E-03	0.0E+00	0.0E+00
O,P-XYLENE	8.8E+05	5.7E+05	1.5E+03	1.5E+03	2.3E-06	1.3E-03	1.3E-03	0.0E+00	0.0E+00
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	3.5E+01*	0.0E+00	3.5E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	2.8E-03	0.0E+00	2.8E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	4.5E-02	0.0E+00	4.5E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.8E-03	0.0E+00	2.8E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	8.6E-04	0.0E+00	8.6E-04	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.9 SITE NCSA-2b: BASIN D (formerly Site 26-4: Basin D; ESE, 1987h/RIC 87293R01 and ESE, 1988j/RIC 87293R01A)

2.9.1 Site-Specific Considerations

Figure NCSA-2b-1 and Tables NCSA-2b-1 and NCSA-2b-2 depict the target contaminants for site NCSA-2b. Borings 4506, 4509, 4586 through 4600, and 4665 through 4682 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-2b (ESE, 1987h/RIC 87293R01).

2.9.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-2b are shown in Figure NCSA-2b-1. Methylphosphonic acid, occurring in Boring 4667 (4-5 ft) was not included in the figure, since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown on this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-2b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-2b-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.9.3 Site Exposure Summary

Tables NCSA-2b-3 through NCSA-2b-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-2b is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the

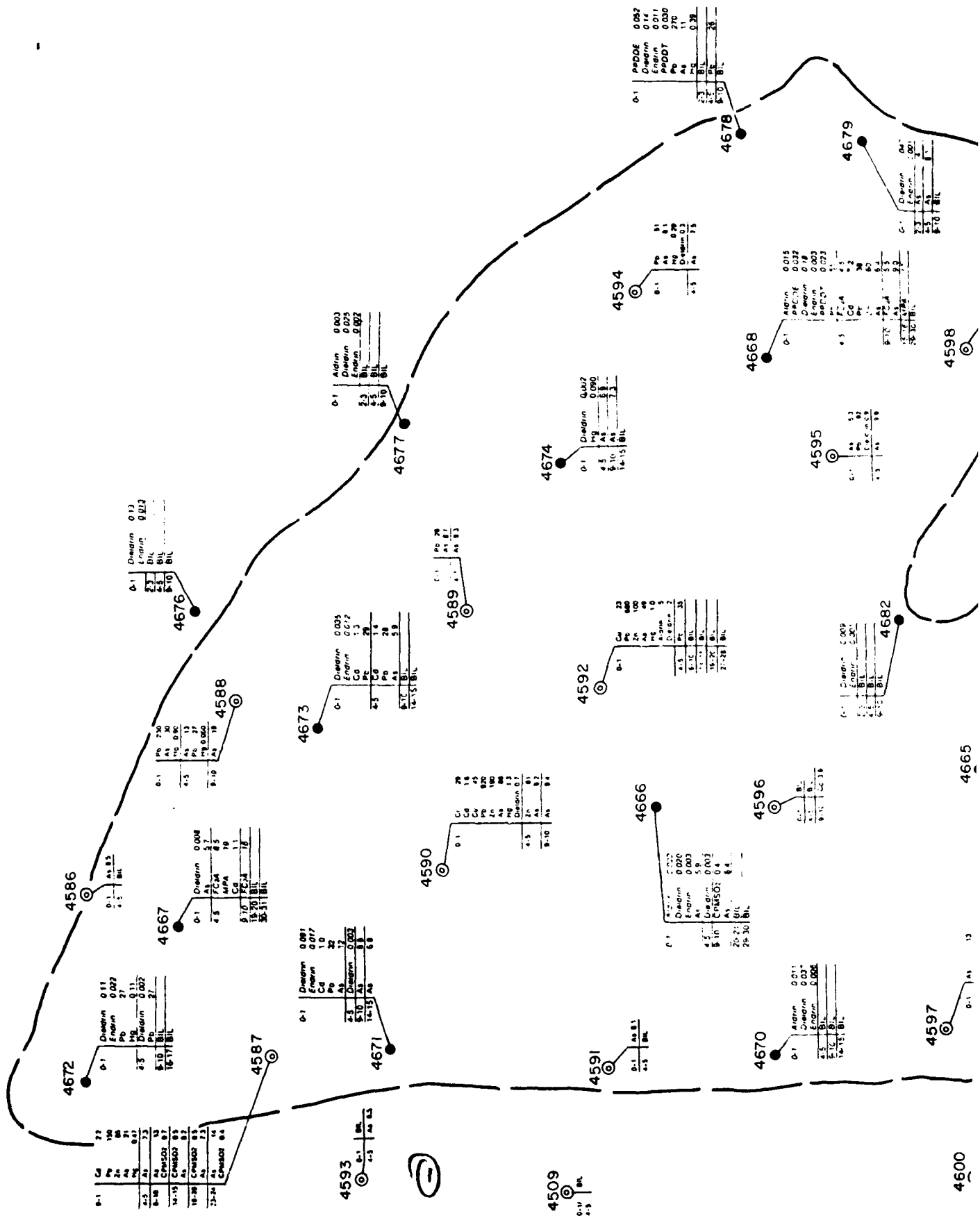
cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Fluoroacetic acid	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
Lead	--	--	--	Direct	Direct
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-2b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



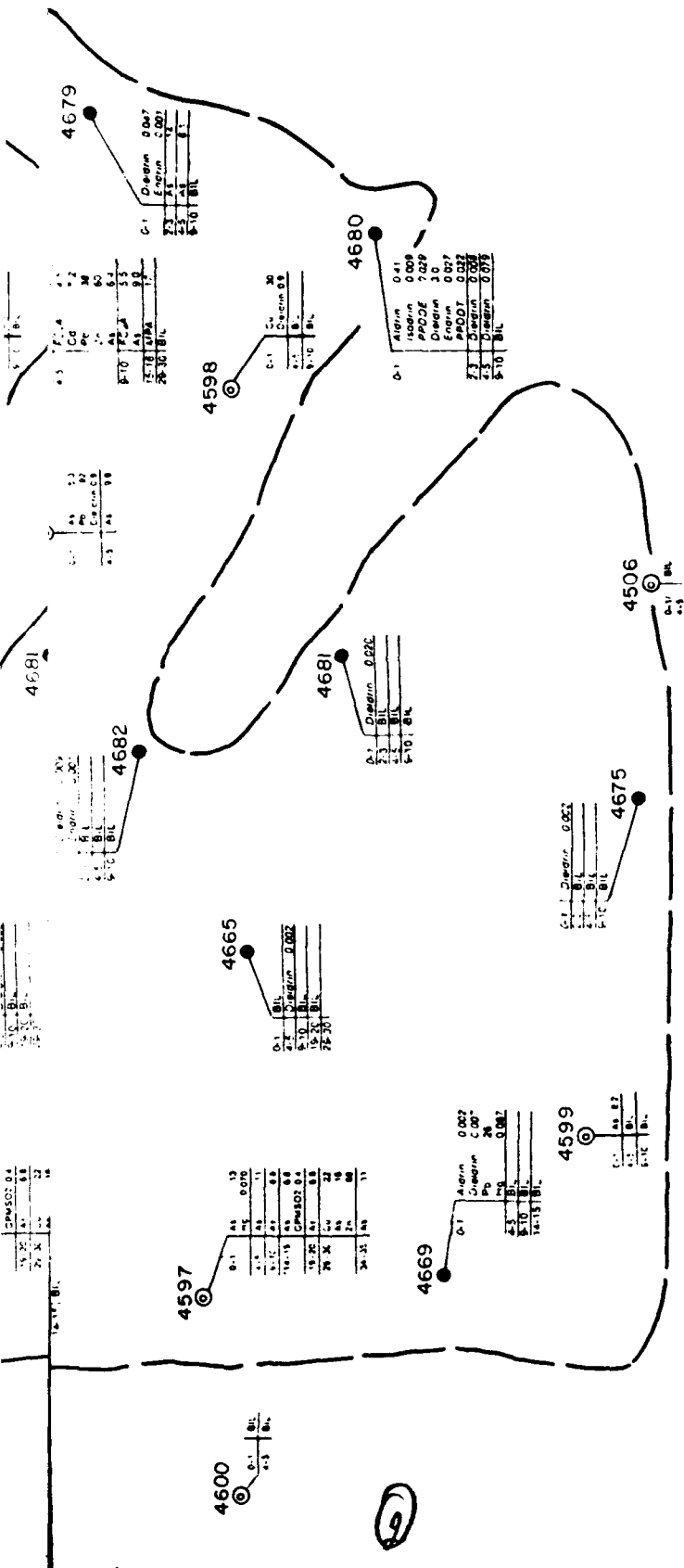
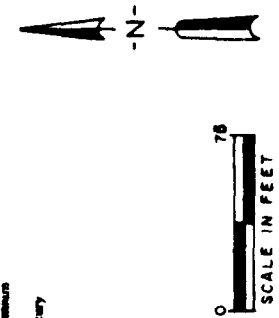


FIGURE NCSCA-2b-1
 Phase I and Phase II Analytes
 Detected Within or Above Indicator Levels
 Rocky Mountain Arsenal
 Prepared by: Ebasco Services Incorporated

Prepared for:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland
 Source HLA, 1988



3

TABLE NCSA-2b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-2b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	5	0-1	4592	5	0-1	4587
Chlorophenylmethyl sulfone	0.7	9-10	4587	0.7	9-10	4587
PPDDE ^{1/}	0.052	0-1	4678	0.052	0-1	4678
PPDDT ^{2/}	0.030	0-1	4678	0.030	0-1	4678
Dieldrin	3.0	0-1	4680	3.0	0-1	4680
Endrin	0.027	0-1	4680	0.027	0-1	4680
Fluoroacetic acid	16	9-10	4667	16	9-10	4667
Isodrin	0.009	0-1	4680	0.009	0-1	4680
Methyl phosphonic acid ^{3/}	19	4-5	4667	19	4-5	4667
Arsenic	86	0-1	4590	--	--	--
Cadmium	3.9	9-10	4596	--	--	--
Copper	45	0-1	4590	--	--	--
Lead	920	0-1	4590	--	--	--
Mercury	1.3	0-1	4590	--	--	--
Zinc	190	0-1	4590	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-2b-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2b

AVERAGE SITE DEPTH TO GROUNDWATER: 37 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ALDRIN	6.1	26005	05/3/88
CHLOROBENZENE	2.9	26005	05/3/88
CHLOROPHENYLMETHYL SULFONE	15	26005	05/3/88
DIISOPROPYLMETHYL PHOSPHONATE	110	26005	05/3/88
DITHIANE	350	26005	05/3/88
1,4-OXATHIANE	68	26005	05/3/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-2b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.4E+05	1.5E+00	3.3E+00*	3.5E-05	3.3E+00*	4.9E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	9.4E+06	1.6E+05	4.3E-06	7.4E-08	4.4E-06	6.1E-11
PPDDE	7.4E+01	8.6E+06	7.4E+01	7.1E-04	6.1E-09	7.1E-04	0.0E+00
PPDDT	7.4E+01	1.8E+07	7.4E+01	4.1E-04	1.7E-09	4.1E-04	0.0E+00
DIELDRIN	1.6E+00	6.5E+04	1.6E+00	1.9E+00*	4.6E-05	1.9E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	5.2E+07	2.5E+03	1.1E-05	5.1E-10	1.1E-05	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	4.1E-01*	0.0E+00	4.1E-01*	0.0E+00
ISODRIN	5.8E+02	1.0E+07	5.8E+02	1.6E-05	8.8E-10	1.6E-05	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	4.0E+00*	0.0E+00	4.0E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.6E-03	0.0E+00	8.6E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.9E-02	0.0E+00	5.9E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.6E-05	0.0E+00	9.6E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2b-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.4E+05	1.5E+00	3.3E+00*	3.5E-05	3.3E+00*	4.9E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	9.4E+06	1.6E+05	4.3E-06	7.4E-08	4.4E-06	6.1E-11
PPDE	7.4E+01	8.4E+06	7.4E+01	7.1E-04	6.1E-09	7.1E-04	0.0E+00
PPDT	7.4E+01	1.8E+07	7.4E+01	4.1E-04	1.7E-09	4.1E-04	0.0E+00
DIELDRIN	1.6E+00	6.5E+04	1.6E+00	1.9E+00*	4.6E-05	1.9E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	5.2E+07	2.5E+03	1.1E-05	5.1E-10	1.1E-05	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	4.1E-01*	0.0E+00	4.1E-01*	0.0E+00
ISODRIN	5.8E+02	1.0E+07	5.8E+02	1.6E-05	8.8E-10	1.6E-05	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	4.0E+00*	0.0E+00	4.0E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.6E-03	0.0E+00	8.6E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.9E-02	0.0E+00	5.9E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.6E-05	0.0E+00	9.6E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2b-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	9.4E+03	2.1E-01	2.4E+01*	5.3E-04	2.4E+01*	7.4E-05
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	1.5E+06	6.7E+04	1.0E-05	4.8E-07	1.1E-05	4.0E-10
PPDDE	1.0E+01	5.7E+05	1.0E+01	5.1E-03	9.1E-08	5.1E-03	0.0E+00
PPDDT	1.0E+01	1.2E+06	1.0E+01	2.9E-03	2.5E-08	2.9E-03	0.0E+00
DIELDRIN	2.2E-01	4.3E+03	2.2E-01	1.4E+01*	7.0E-04	1.4E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	8.1E+06	1.1E+03	2.6E-05	3.3E-09	2.6E-05	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	9.7E-01*	0.0E+00	9.7E-01*	0.0E+00
ISODRIN	2.5E+02	1.6E+06	2.5E+02	3.7E-05	5.7E-09	3.7E-05	0.0E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	3.9E+00	0.0E+00	3.9E+00	2.2E+01*	0.0E+00	2.2E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	6.8E-02	0.0E+00	6.8E-02	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	1.8E-04	0.0E+00	1.8E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.0E-01	0.0E+00	1.0E-01	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	6.6E-04	0.0E+00	6.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.8E-04	0.0E+00	1.8E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	2.6E+00*	1.3E+01*	1.5E+01*	7.4E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	7.4E+02	7.3E+02	7.7E-06	9.5E-04	9.6E-04	2.8E-07
PPDDE	9.3E+01	1.9E+01	1.6E+01	5.6E-04	2.7E-03	3.2E-03	0.0E+00
PPDDT	9.3E+01	1.9E+01	1.6E+01	3.2E-04	1.5E-03	1.9E-03	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.5E+00*	5.2E-02	1.6E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-05
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	2.9E+02	2.4E+02	2.0E-05	9.4E-05	1.1E-04	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	7.4E-01*	0.0E+00	7.4E-01*	0.0E+00
ISODRIN	3.2E+02	6.7E+01	5.5E+01	2.8E-05	1.3E-04	1.6E-04	0.0E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ARSENIC	2.0E+01	0.0E+00	2.0E+01	4.3E+00*	0.0E+00	4.3E+00*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	1.1E-02	0.0E+00	1.1E-02	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	2.6E-04	0.0E+00	2.6E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.4E-01*	0.0E+00	1.4E-01*	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	9.3E-04	0.0E+00	9.3E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	2.4E-04	0.0E+00	2.4E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-2b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EN
ALDRIN	1.2E-01	1.9E+04	4.0E-01	9.0E-02	4.3E+01*	1.3E+01*	5.6E+01*	3.7E-05	2.2E-
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-07	1.1E-
CHLOROPHENYLMETHYL SULFONE	1.7E+04	1.3E+06	7.4E+02	7.0E+02	4.2E-05	9.5E-04	9.9E-04	4.6E-10	2.8E-
PPDDE	5.7E+00	1.1E+06	1.9E+01	4.4E+00	9.1E-03	2.7E-03	1.2E-02	0.0E+00	0.0E+
PPDDT	5.7E+00	2.4E+06	1.9E+01	4.4E+00	5.2E-03	1.5E-03	6.8E-03	0.0E+00	0.0E+
DIELDRIN	1.2E-01	8.6E+03	1.9E+01	1.2E-01	2.5E+01*	1.6E-01*	2.5E+01*	0.0E+00	0.0E+
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-08	1.1E-
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+
ENDRIN	2.5E+02	7.0E+06	8.6E+02	2.0E+02	1.1E-04	3.1E-05	1.4E-04	0.0E+00	0.0E+
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	4.0E+00*	0.0E+00	4.0E+00*	0.0E+00	0.0E+
ISODRIN	5.9E+01	1.4E+06	2.0E+02	4.6E+01	1.5E-04	4.5E-05	2.0E-04	0.0E+00	0.0E+
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	5.3E+01*	0.0E+00	5.3E+01*	0.0E+00	0.0E+
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	5.1E-01*	0.0E+00	5.1E-01*	0.0E+00	0.0E+
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	7.9E-04	0.0E+00	7.9E-04	0.0E+00	0.0E+
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	4.2E-01*	0.0E+00	4.2E-01*	0.0E+00	0.0E+
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.8E-03	0.0E+00	2.8E-03	0.0E+00	0.0E+
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.4E-03	0.0E+00	1.4E-03	0.0E+00	0.0E+

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.10 SITE NCSA-2c: BASIN E (formerly Site 26-5; ESE, 1987i/RIC 87203R04 and ESE, 1988k/RIC 87203R04A)

2.10.1 Site-Specific Considerations

Figure NCSA-2c-1 and Tables NCSA-2c-1 and NCSA-2c-2 depict the target contaminants for site NCSA-2c. Borings 4517, 4601 through 4616, and 4650 through 4664 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-2c (ESE, 1987i/RIC 87203R04).

2.10.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-2c are shown in Figure NCSA-2c-1. The following contaminants were not included in this figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Oxybisethanol, occurring in Borings 4601 (0-1 and 4-5 ft), 4602 (4-5 ft and 14-15 ft), 4607 (4-5 ft), 4608 (0-1 and 4-5 ft), 4609 (0-1, 4-5, 9-10, and 14-15 ft), 4610 (0-1 ft), and 4611 (0-1 ft), and phosphoric acid, triphenyl ester, occurring in Borings 4602 (9-10 ft), 4607 (0-1 and 4-5 ft), 4608 (0-1, 4-5, and 9-10 ft), 4609 (0-1, 4-5, and 19-20 ft), 4610 (4-5 ft) and 4611 (0-1 ft). Although not shown on this figure, these nontarget compounds were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-2c-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Methylene chloride, shown in Table NCSA-2c-1 is excluded from consideration in the exposure analysis for this site, because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Diisopropylmethyl phosphonate was not detected in the 0-10 ft. Table NCSA-2c-2 summarizes the maximum concentrations

detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.10.3 Site Exposure Summary

Tables NCSA-2c-3 through NCSA-2c-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-2c is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	Direct	Direct	Direct	Direct	Direct
Fluoroacetic acid	Direct	Direct	Direct	Direct	Direct
Arsenic	Direct	Direct	Direct	Direct	Direct
Chromium	Direct	Direct	Direct	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-2c is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

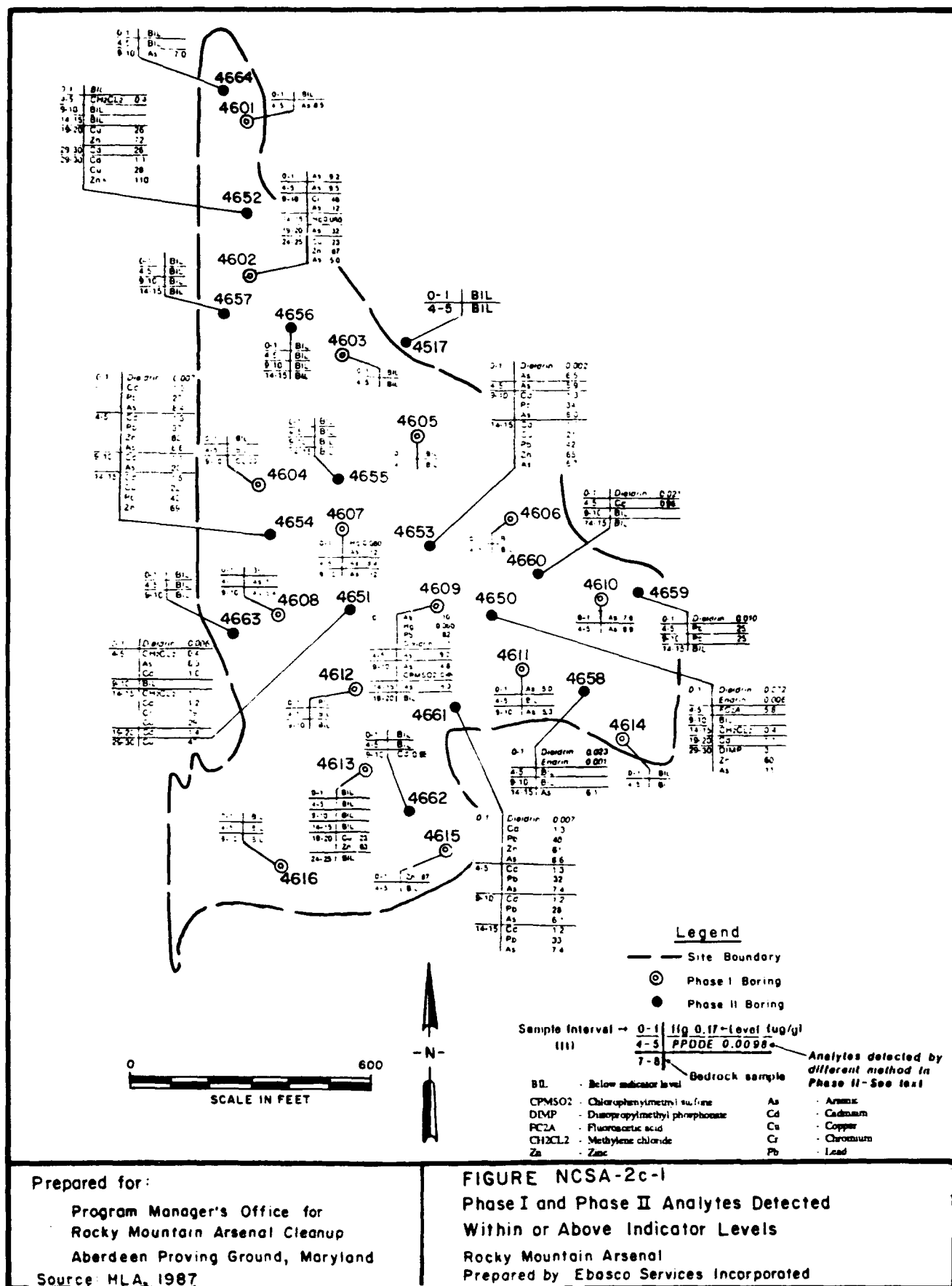


TABLE NCSA-2c-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-2c

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Chlorophenylmethyl sulfone	0.4	9-10	4609	0.4	9-10	4609
Dieldrin	1	0-1	4609	1	0-1	4609
Diisopropylmethyl phosphonate	--	--	--	3	29-30	4650
Endrin	0.006	0-1	4650	0.006	0-1	4650
Fluoroacetic acid	5.8	4-5	4650	5.8	4-5	4650
Methylene chloride ^{1/}	0.4	4-5	4651	1	14-15	4651
Oxybisethanol ^{2/}	3.0	4-5	4652	--	--	--
Phosphoric acid, triphenyl ester ^{2/}	20	9-10	4609	3.0	9-10	4609
Arsenic	20	9-10	4602	20	9-10	4602
Chromium	20	9-10	4654	--	--	--
Lead	46	9-10	4602	--	--	--
Zinc	82	0-1	4609	--	--	--
	87	0-1	4615	--	--	--

1/ Suspected laboratory contaminant.

2/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA
Max.
ug/g
ft
North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-2c-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2c

AVERAGE SITE DEPTH TO GROUNDWATER: 32 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROFORM	26	26088	11/21/88
VAPONA	0.95	26088	11/21/88
DIISOPROPYLMETHYL PHOSPHONATE	11	26088	11/21/88
DIELDRIN	2.0	26088	11/21/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYT
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-2c-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.3E+07	1.6E+05	2.4E-06	3.1E-08	2.5E-06	0.0E+00
DIELDRIN	1.6E+00	8.7E+04	1.6E+00	6.4E-01*	1.1E-05	6.4E-01*	3.8E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.6E+06	4.7E+05	0.0E+00	1.8E-06	1.8E-06	2.2E-10
ENDRIN	2.5E+03	7.1E+07	2.5E+03	2.4E-06	8.5E-11	2.4E-06	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	1.5E-01*	0.0E+00	1.5E-01*	0.0E+00
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-10
ARSENIC	2.2E+01	0.0E+00	2.2E+01	9.3E-01*	0.0E+00	9.3E-01*	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	6.6E-01*	0.0E+00	6.6E-01*	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.3E-03	0.0E+00	5.3E-03	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.4E-05	0.0E+00	4.4E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2c-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.3E+07	1.6E+05	2.4E-06	3.1E-08	2.5E-06	0.0E+00
DIELDRIN	1.6E+00	8.7E+04	1.6E+00	6.4E-01*	1.1E-05	6.4E-01*	3.8E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.6E+06	4.7E+05	0.0E+00	1.8E-06	1.8E-06	2.2E-10
ENDRIN	2.5E+03	7.1E+07	2.5E+03	2.4E-06	8.5E-11	2.4E-06	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	1.5E-01*	0.0E+00	1.5E-01*	0.0E+00
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-10
ARSENIC	2.2E+01	0.0E+00	2.2E+01	9.3E-01*	0.0E+00	9.3E-01*	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	6.6E-01*	0.0E+00	6.6E-01*	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.3E-03	0.0E+00	5.3E-03	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.4E-05	0.0E+00	4.4E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2c-5

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	4.8E-05
CHLOROPHENYLMETHYL SULFONE	7.0E+04	2.0E+06	6.7E+04	5.7E-06	2.0E-07	5.9E-06	0.0E+00
DIELDRIN	2.2E-01	5.8E+03	2.2E-01	4.6E+00*	1.7E-04	4.6E+00*	5.8E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	1.6E+06	2.4E+05	0.0E+00	1.9E-06	1.9E-06	1.4E-09
ENDRIN	1.1E+03	1.1E+07	1.1E+03	5.7E-06	5.5E-10	5.7E-06	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	3.5E-01*	0.0E+00	3.5E-01*	0.0E+00
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	4.5E-09
ARSENIC	3.9E+00	0.0E+00	3.9E+00	5.1E+00*	0.0E+00	5.1E+00*	0.0E+00
CHROMIUM	8.8E+00	0.0E+00	8.8E+00	5.2E+00*	0.0E+00	5.2E+00*	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	8.9E-03	0.0E+00	8.9E-03	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	8.3E-05	0.0E+00	8.3E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2c-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	6.9E-03
CHLOROPHENYLMETHYL SULFONE	9.1E+04	7.4E+02	7.3E+02	4.4E-06	5.4E-04	5.5E-04	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	5.0E-01*	1.7E-02	5.2E-01*	8.3E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	2.9E+02	2.9E+02	0.0E+00	1.0E-02	1.0E-02	1.4E-06
ENDRIN	1.4E+03	2.9E+02	2.4E+02	4.4E-06	2.1E-05	2.5E-05	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	2.7E-01*	0.0E+00	2.7E-01*	0.0E+00
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	6.4E-07
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.0E+00*	0.0E+00	1.0E+00*	0.0E+00
CHROMIUM	5.5E+01	0.0E+00	5.5E+01	8.4E-01*	0.0E+00	8.4E-01*	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.3E-02	0.0E+00	1.3E-02	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-2c-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-05	2.1E-02
CHLOROPHENYLMETHYL SULFONE	1.7E+04	1.7E+06	7.4E+02	7.0E+02	2.4E-05	5.4E-04	5.7E-04	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	1.2E+04	1.9E+01	1.2E-01	8.2E+00*	5.2E-02	8.2E+00*	2.9E-07	2.5E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	2.2E+05	2.9E+02	2.9E+02	0.0E+00	1.0E-02	1.0E-02	1.6E-09	1.4E-04
ENDRIN	2.5E+02	9.4E+06	8.6E+02	2.0E+02	2.4E-05	7.0E-06	3.1E-05	0.0E+00	0.0E+00
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	1.5E+00*	0.0E+00	1.5E+00*	0.0E+00	0.0E+00
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-09	1.9E-04
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.2E+01*	0.0E+00	1.2E+01*	0.0E+00	0.0E+00
CHROMIUM	1.1E+00	0.0E+00	0.0E+00	1.1E+00	4.0E+01*	0.0E+00	4.0E+01*	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	3.7E-02	0.0E+00	3.7E-02	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	6.2E-04	0.0E+00	6.2E-04	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.11 SITE NCSA-2d: DRAINAGE DITCHES (formerly Site 26-3: Basin C; ESE, 1987g/RIC 87343R03 and ESE, 1988i/RIC 87343R03A; Site 35-4/26-7: Basins A, B, and C Drainage Ditches; ESE, 1987l/RIC 87203R06 and ESE, 1988s/RIC 87203R06A; Section 26-Uncontaminated; ESE, 1987j/RIC8729R02 and Section 26-Nonsource Area; ESE, 1988q/RIC 87293R02A

2.11.1 Site-Specific Considerations

Figure NCSA-2d-1 and Tables NCSA-2d-1 and NCSA-2d-2 depict the target contaminants for site NCSA-2d. Borings 4052, 4108 through 4111, 4577, 4584, 4593, 4600, and 4631, from Sites 26-3, 35-4/26-7 and Boring 4505 from the Section 26-Uncontaminated were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-2d.

2.11.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-2d are shown in Figure NCSA-2d-1. Table NCSA-2d-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-2d-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.11.3 Site Exposure Summary

Tables NCSA-2d-3 through NCSA-2d-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-2d is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-2d is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

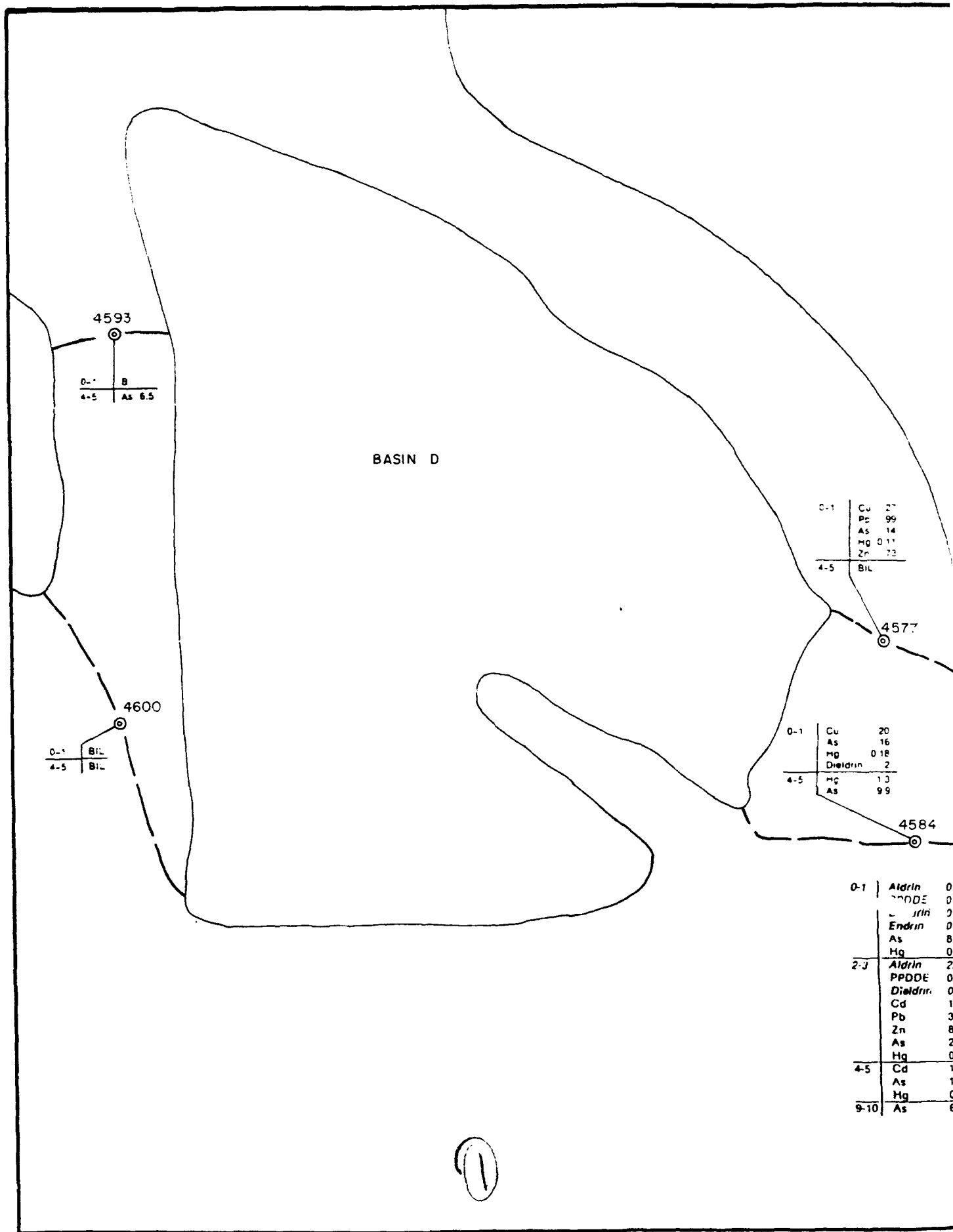


TABLE NCSA-2d-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-2d

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	4	0-1	4631	4	0-1	4631
PPDDE ^{1/}	0.016	2-3	4111	0.016	2-3	4111
Dieldrin	4	0-1	4631	4	0-1	4631
Endrin	0.041	7-8	4110	0.041	7-8	4110
Arsenic	30	0-1	4109	--	--	--
Lead	130	4-5	4052	--	--	--
Mercury	1.7	0-1	4109	--	--	--
Zinc	82	2-3	4111	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-2d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2d

AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,2-DICHLOROETHANE	5.4	26006	11/21/88
ALDRIN	0.81	26006	11/21/88
ATRAZINE	24	26006	11/21/88
CHLOROFORM	1.1	26006	11/21/88
CHLOROBENZENE	5.4	26006	11/21/88
CHLOROPHENYLMETHYL SULFONE	660	26006	11/21/88
DIBROMOCHLOROPROPANE	0.26	26006	11/21/88
VAPONA	0.88	26006	11/21/88
DIISOPROPYLMETHYL PHOSPHONATE	980	26006	11/21/88
DITHIANE	220	26006	11/21/88
DIELDRIN	0.17	26006	11/21/88
ENDRIN	0.12	26006	11/21/88
ISODRIN	0.12	26006	11/21/88
MALATHION	6.0	26006	11/21/88
1,4-OXATHIANE	14	26006	11/21/88
PPDDT	0.14	26006	11/21/88
PARATHION	4.6	26006	11/21/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALY-
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-2d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-2d

AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
SUPONA	3.8	26006	11/21/88
TETRACHLOROETHYLENE	1.1	26006	11/21/88
TRICHLOROETHYLENE	2.6	26006	11/21/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYT
FOR THE PERIOD March 17, 1987 TO February 28, 1989.**
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-2d-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.1E+06	1.5E+00	2.7E+00*	3.6E-06	2.7E+00*	9.3E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-14
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-10
PPDDE	7.4E+01	6.7E+07	7.4E+01	2.2E-04	2.4E-10	2.2E-04	0.0E+00
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	4.2E-07
DIELDRIN	1.6E+00	5.0E+05	1.6E+00	2.5E+00*	7.9E-06	2.5E+00*	5.4E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.1E+08	2.5E+03	1.7E-05	1.0E-10	1.7E-05	9.6E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-14
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.0E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	7.0E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-07
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-11
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.4E+00*	0.0E+00	1.4E+00*	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	8.4E-03	0.0E+00	8.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.1E-04	0.0E+00	5.1E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.1E-05	0.0E+00	4.1E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2d-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.1E+06	1.5E+00	2.7E+00*	3.6E-06	2.7E+00*	9.3E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-14
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-10
PPDDE	7.4E+01	6.7E+07	7.4E+01	2.2E-04	2.4E-10	2.2E-04	0.0E+00
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	4.2E-07
DIELDRIN	1.6E+00	5.0E+05	1.6E+00	2.5E+00*	7.9E-06	2.5E+00*	5.4E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-09
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.1E+08	2.5E+03	1.7E-05	1.0E-10	1.7E-05	9.6E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-14
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	7.0E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	7.0E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-07
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-11
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.4E+00*	0.0E+00	1.4E+00*	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	8.4E-03	0.0E+00	8.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.1E-04	0.0E+00	5.1E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	4.1E-05	0.0E+00	4.1E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2d-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	7.3E+04	2.1E-01	1.9E+01*	5.5E-05	1.9E+01*	1.4E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-14
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	3.4E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-09
PPDDE	1.0E+01	4.4E+06	1.0E+01	1.6E-03	3.6E-09	1.6E-03	0.0E+00
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-07
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-06
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	6.4E-06
DIELDRIN	2.2E-01	3.3E+04	2.2E-01	1.8E+01*	1.2E-04	1.8E+01*	8.2E-09
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-08
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	6.3E+07	1.1E+03	3.9E-05	6.5E-10	3.9E-05	6.2E-12
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-09
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-13
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-12
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-13
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-06
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-06
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-10
ARSENIC	3.9E+00	0.0E+00	3.9E+00	7.6E+00*	0.0E+00	7.6E+00*	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.4E-02	0.0E+00	1.4E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	8.6E-04	0.0E+00	8.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	7.8E-05	0.0E+00	7.8E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-2d-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	2.1E+00*	1.0E+01*	1.2E+01*	1.1E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-10
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-05
PPDDE	9.3E+01	1.9E+01	1.6E+01	1.7E-04	8.2E-04	9.9E-04	0.0E+00
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-04
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	9.3E-04
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.2E-03
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	2.0E+00*	7.0E-02	2.1E+00*	6.7E-06
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-04
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.6E+04	1.3E+03	3.0E-05	2.6E-06	3.2E-05	3.6E-08
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-05
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-09
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	7.1E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	8.6E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-03
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	5.6E-07
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.5E+00*	0.0E+00	1.5E+00*	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	2.0E-02	0.0E+00	2.0E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.2E-03	0.0E+00	1.2E-03	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.0E-04	0.0E+00	1.0E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-2d-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	1.5E+05	4.0E-01	9.0E-02	3.4E+01*	1.0E+01*	4.4E+01*	7.0E-07	3.4E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	8.5E-14	4.2E-10
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-08	2.4E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-07	8.3E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.9E-09	1.4E-05
PPDDE	5.7E+00	8.9E+06	1.9E+01	4.4E+00	2.8E-03	8.2E-04	3.6E-03	0.0E+00	0.0E+00
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	8.2E-08	4.0E-04
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-07	2.8E-03
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	3.2E-06	1.6E-02
DIELDRIN	1.2E-01	6.7E+04	1.9E+01	1.2E-01	3.3E+01*	2.1E-01*	3.3E+01*	4.1E-09	2.0E-05
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-08	1.2E-04
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	5.4E+07	1.6E+04	2.5E+02	1.6E-04	2.6E-06	1.6E-04	7.2E-12	3.6E-08
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	4.3E-09	2.1E-05
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.9E-13	1.4E-09
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	5.2E-12	2.6E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-13	7.1E-11
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	5.3E-07	2.6E-03
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-06	1.2E-02
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-10	1.7E-06
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.9E+01*	0.0E+00	1.9E+01*	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	5.9E-02	0.0E+00	5.9E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	3.7E-03	0.0E+00	3.7E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	5.9E-04	0.0E+00	5.9E-04	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.12 SITE NCSA-3: BASIN F (formerly Site 26-6: Basin F; ESE, 1988I/RIC 88173R02; EBASCO, 1989b/RIC 88173R02B)

2.12.1 Site-Specific Considerations

Figures NCSA-3-1 and NCSA-3-2 and Tables NCSA-3-1 and NCSA-3-2 depict the target contaminants for site NCSA-3. Borings 4617 through 4630, 4639 through 4646, 002606DJ11, 002606DJ12, 002606DJ14, 002606DJ16 through 002606DJ20, 002606DJ22 through 002606DJ25, 002606DJ27, 002606DJ28, and 002606DJ30 through 002606DJ40 were included in this exposure assessment, consistent with the North Central SAR. The historical search conducted under the contamination assessment revealed that carbon tetrachloride and n-nitrosodimethylamine may have been present in discharges of liquid waste to Basin F (ESE, 1988I/RIC 88173R02); however, they were not detected in soil during the Phase I and Phase IIb investigations. According to site history, no other chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-3 (ESE, 1988I/RIC 88173R02).

2.12.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-3 are shown in Figures NCSA-3-1 and NCSA-3-2 in the Phase IIb CAR (EBASCO, 1989b/RIC 88173R02B). The following contaminants were not included in these figures, since they were not considered target contaminants during the Phase I and Phase IIb investigations: Hexachlorobutadiene, occurring in Borings 4643 (0-1 ft), 4644 (0-1 and 2-3 ft), 4645 (0-1 and 2-3 ft), 2606DJ14 (9-10, 19-20, 29-30 and 37-37.5 ft), 2606DJ37 (4-5 ft), and 2606DJ38 (4-5 ft); oxybisethanol, occurring in Boring 4621 (4-5 ft); tetrachlorobenzene, occurring in Borings 4620 (0.5-1.5 ft), 4645 (0-1 and 2-3 ft), 4646 (0-1 ft), 2606DJ34 (0-1 ft) and 2606DJ36 (4-5 ft); and 1,1,2,2-tetrachloroethane, occurring in Boring 4643 (0-1 ft). Although not shown in these figures, these nontarget compounds were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-3-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Methylene chloride was not detected in the 0-10 ft interval. Table NCSA-3-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.12.3 Site Exposure Summary

Tables NCSA-3-3 through NCSA-3-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-3 is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

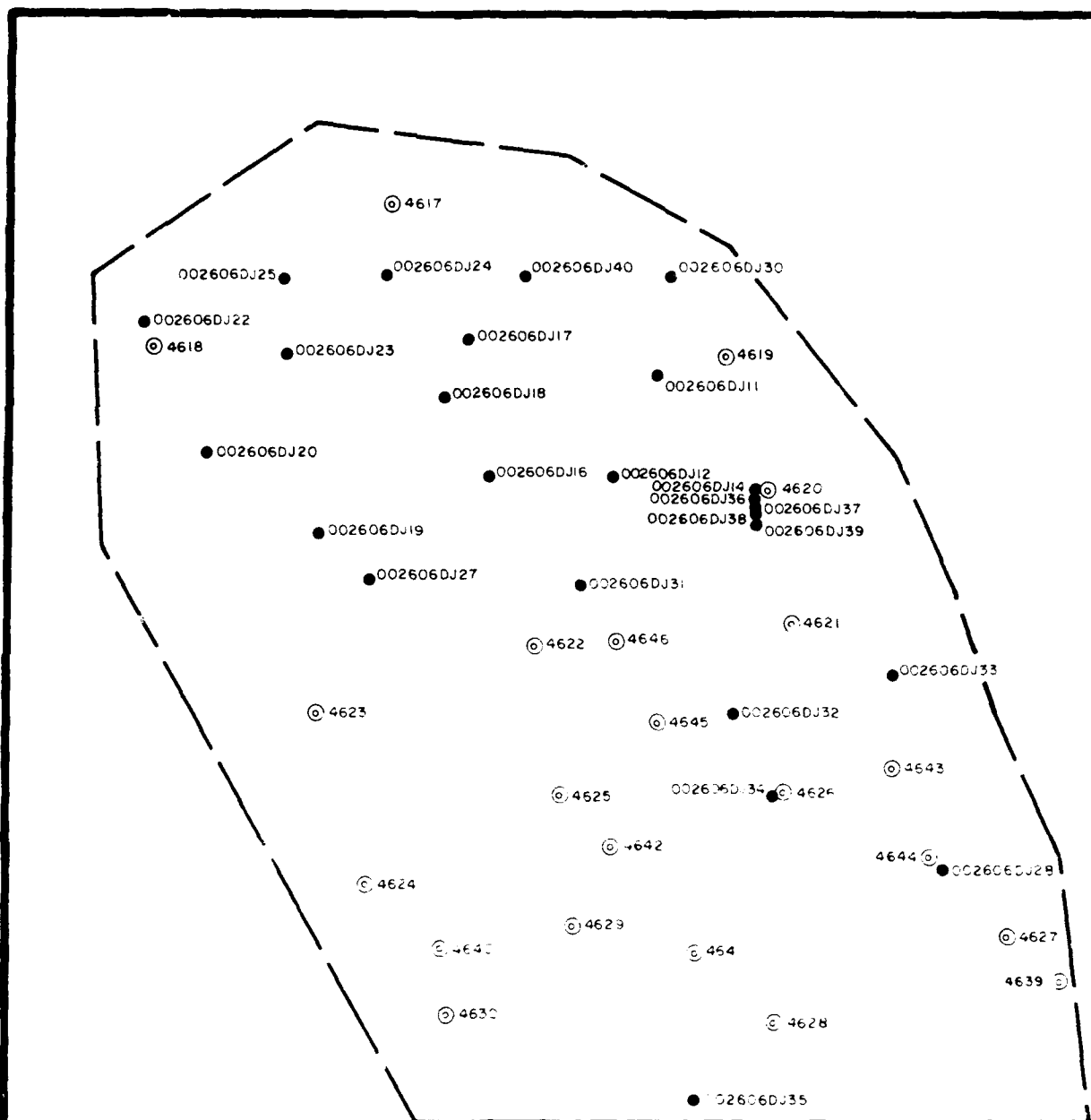
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Chloroacetic acid	Direct	Direct	Direct	Direct	Direct
Dibromochloropropane	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Endrin	Direct	Direct	Direct	Direct	Direct
Isodrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
1,1,2,2-Tetrachloroethane	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
Chloroform	--	--	Direct	Indirect	Dir/Ind
Dicyclopentadiene	--	--	Dir/Ind	Dir/Ind	Dir/Ind
Tetrachloroethylene	--	--	Direct	Indirect	Dir/Ind
Benzene	--	--	--	Indirect	Indirect
Bicycloheptadiene	--	--	--	Indirect	Indirect
Chlorophenylmethyl sulfide	--	--	--	Indirect	Indirect

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	--	--	Direct
Chlorophenylmethyl sulfone	--	--	--	Indirect	Indirect
Chlorophenylmethyl sulfoxide	--	--	--	Indirect	Indirect
1,2-Dichloroethane	--	--	--	Indirect	Indirect
Methylene chloride	--	--	--	Indirect	Indirect
Toluene	--	--	--	Indirect	Indirect

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

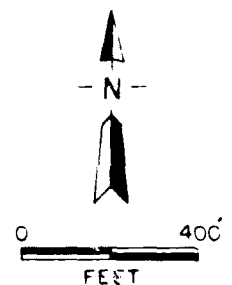
The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-3 is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Legend

- 4630 ⊙ Phase I Boring
 002606DJ35 ● Phase II Boring
 — Site Boundary



Prepared for:

Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland

FIGURE NCSA-3-1

Phase I and Phase II Boring
 Locations

Rocky Mountain Arsenal
 Prepared by: Ebasco Services Incorporated

002606DJ11

1-2	As	3.5
4-5	CLC2A	760
	CPMSO2	0.4
	Cr	29
	MPA	59
	TDGCL	23
	Zn	78

002606DJ12

1-2	As	3.2
	CPMSO2	1
	MPA	70
	Zn	80
4-5	As	3.8
	Cr	37
	DIMP	3
	Hg	0.12
	MPA	24
	Pb	36
	Zn	74
9-10	As	2.7
	Cd	1.3
	Cr	26
	Hg	0.061
	MPA	14
	Pb	36
	Zn	64
14-15	Hg	0.059
19-20	Hg	0.065
29-30	As	2.5
	Hg	0.065
34-35	Hg	0.086

002606DJ14

1-2	As	2.9
	CLC2A	54
	CPMSO2	3
	DIMP	2
	MPA	50
4-5	ALDRN	100
	As	5.2
	CLC2A	6200
	CPMSO2	30
	CU	1400
	DCPD (VO)	8
	DLDRN	20
	Hg	0.14
	ISODR	100
	MEC6H5	4
	TDGCL	95
	Zn	62
	NA (MPA)	
9-10	As	4.1
	CLC2A	59
	CPMSO2	10
	CU	32
	DCPD (VO)	400
	DCPD (SVO)	20
	DLDRN	100
	Hg	0.042
	MEC6H5	100
	TDGCL	39
	Zn	84
	NA (MPA)	
14-15	ALDRN	0.8
	As	2.4
	CLC2A	79
	DCPD (VO)	0.9
	ISODR	0.8
	TDGCL	73
	NA (MPA)	
19-20	ALDRN	2000
	CLC2A	55
	DCPD (VO)	1000
	DCPD (SVO)	2000
	DLDRN	200
	MEC6H5	200
	NA (MPA)	
29-30	ALDRN	300
	CLC2A	64
	DCPD (VO)	500
	DCPD (SVO)	300
	DLDRN	200
	ENDRN	400
	Hg	0.033
	MPA	140
	MEC6H5	30
37-37.5	CLC2A	52
	DCPD (VO)	1000
	DCPD (SVO)	30
	DLDRN	10
	ENDRN	20
	Hg	0.057
	MPA	110
	MEC6H5	40

002606DJ18

1-2	Cr	25
	DIMP	3
	MPA	35
	Zn	68
4-5	As	4.0
	DIMP	2
	Hg	0.089
9-10	Hg	0.089
14-15	DIMP	2
	Hg	0.089
19-20	Hg	0.10
29-30	Hg	0.11
36.5-37.5	BIL	

002606DJ17

1-2	As	3.1
	MPA	42

002606DJ18

1-2	As	3.9
4-5	As	4.1
	Hg	0.032
9-10	As	2.7
14-15	CLC2A	43
	Hg	0.031
20-21	Hg	0.029
29-30	Hg	0.038
36.5-37.5	Hg	0.056
	Zn	61

002606DJ19

1-2	BIL	
4-5	Hg	0.074
9-10	Hg	0.056
	Pb	29
14-15	Hg	0.032
19-20	Hg	0.038
29-30	Hg	0.071
36.5-37.5	Hg	0.057

002606DJ20

1-2	As	3.2
4-5	As	4.2
	Hg	0.068
9-10	As	3.5
	Hg	0.084
14-15	Hg	0.068
19-20	Hg	0.079
29-30	CU	22
	Hg	0.16
	Pb	35
	Zn	70
36.5-37.5	GH2CL2	3
	Hg	0.10

002606DJ22

1-2	As	27
	CPMSO	3
	CPMSO2	20
	CU	67
	MPA	6.8
	TDGCL	100
4-5	As	4.9
	CLC2A	880
	MPA	1100
	TDGCL	19
9-10	As	3.5
	MPA	120
14-15	BIL	
19-20	BIL	
29-30	BIL	
39-40	BIL	

002606DJ23

1-2	As	41
	Cr	28
	MPA	54
	Zn	70

002606DJ24

1-2	As	35
	DIMP	2
4-5	As	2.8
9-10	Cr	28
	MPA	9.1
14-15	Cr	27
	MPA	15
19-20	BIL	
29-30	BIL	
38.6-39.6	BIL	

002606DJ25

1-2	As	37
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002606DJ27

1-2	CLC2A	510
	MPA	450
	TDGCL	9
4-5	As	3.2
	Hg	0.075
9-10	As	2.7
	Cr	31
	Hg	0.049
14-15	Hg	0.054
20-21	Hg	0.040
29-30	Hg	0.075
39-40	Hg	0.051

002606DJ28

1-2	ALDRN	70
	As	4.8
	CLC2A	200
	CPMSO2	2
	DCPD (VO)	0.9
	DLDRN	10
	ENDRN	10
	MPA	79
	ISODR	400
	Zn	64
4-5	As	2.8
	C6H6	0.3
	CLC2A	52
	Hg	0.057
	MPA	14
9-10	As	3.0
	Cd	1.3
	CLC2A	58
	Hg	0.033
	MPA	17
14-15	CHCL3	0.4
	CLC2A	79
	DIMP	1
	Hg	0.076
	MPA	31
19-20	CHCL3	0.4
	Hg	0.066
29-30	As	5.1
	CHCL3	0.7
	Hg	0.25
	MPA	4.8
	MEC6H5	0.4
34-35	CHCL3	2
	Hg	0.068

002606DJ30

0-1	CPMSO2	0.9
	Hg	0.071
	MPA	470
4-5	Hg	0.060
9-10	Cd	1.3
	Hg	0.061
14-15	CLC2A	230
	TDGCL	6.0
19-20	Hg	0.040
29-30	Cd	2.4
	Hg	0.038
	MPA	6.5
38.5-39.5	MPA	8.4

002606DJ31

0-1	As	5.3
	CPMSO2	0.9
	Cr	31
	Hg	0.13
	MPA	140
	Pb	38
	Zn	78
	NA (TDGCL, CLC2A)	
4-5	As	3.8
	Cd	1.2
	Cr	25
	DIMP	2
	Hg	0.13
	MPA	6.4
	Pb	33
	NA (TDGCL, CLC2A)	
9-10	As	3.0
	Cr	29
	Hg	0.081
	MPA	13
	Pb	31
	Zn	73
	NA (TDGCL, CLC2A)	
14-15	Hg	0.12
	NA (TDGCL, CLC2A)	
19-20	Hg	0.096
	NA (TDGCL, CLC2A)	
29-30	Hg	0.11
	NA (TDGCL, CLC2A)	
35-36	CU	35
	Hg	0.12
	Pb	33
	Zn	84
	NA (TDGCL, CLC2A)	

002606DJ32

0-1	As	4.2
	Cd	2.3
	CPMSO2	3
	Cr	25
	Hg	0.096
	MPA	75
	Pb	26
	NA (TDGCL, CLC2A)	
4-5	As	3.1
	Hg	0.095
	NA (TDGCL, CLC2A)	
9-10	As	3.4
	Cd	1.2
	Hg	0.11
	NA (TDGCL, CLC2A)	
14-15	Cd	1.2
	Hg	0.11
	Pb	35
	Zn	68
	NA (TDGCL, CLC2A)	
19-20	Hg	0.091
	NA (TDGCL, CLC2A)	
29-30	Hg	0.081
	NA (TDGCL, CLC2A)	
30-31	Cd	1.1
	Hg	0.094
	NA (TDGCL, CLC2A)	
36-37	CHCL3	1
	Hg	0.14
	NA (TDGCL, CLC2A)	

002606DJ33

0-1	As	3.0
	Cd	1.2
	Cr	29
	Hg	0.085
	Pb	26
	Zn	64
4-5	As	3.0
	Cd	2.0
	Hg	0.086
	Pb	25
	Zn	65
9-10	As	2.9
	Cr	28
	Hg	0.12
	Pb	26
	Zn	61
14-15	Hg	0.082
	Zn	62
19-20	Hg	0.082
29-30	Hg	0.081
37-38	BIL	

(1)

002606DJ34 31

0-1	As	5.3
	CPMSO2	0.9
	Cr	31
	Hg	0.13
	MPA	140
	Pb	38
	Zn	78
	NA (TDGCL, CLC2A)	
	As	3.9
	Cd	1.2
	Cr	25
	DIMP	2
	Hg	0.13
	MPA	6.4
	Pb	33
	NA (TDGCL, CLC2A)	
4-5	As	3.0
	Cr	29
	Hg	0.081
	MPA	13
	Pb	31
	Zn	73
	NA (TDGCL, CLC2A)	
	Hg	0.12
	NA (TDGCL, CLC2A)	
9-10	Hg	0.098
	NA (TDGCL, CLC2A)	
	Hg	0.11
	NA (TDGCL, CLC2A)	
	CU	35
	Hg	0.12
	Pb	33
	Zn	84
	NA (TDGCL, CLC2A)	
14-15	As	4.2
	Cd	2.3
	CPMSO2	3
	Cr	25
	Hg	0.096
	MPA	75
	Pb	28
	NA (TDGCL, CLC2A)	
	As	3.1
	Hg	0.095
	NA (TDGCL, CLC2A)	
002606DJ35	As	3.4
	Cd	1.2
	Hg	0.11
	NA (TDGCL, CLC2A)	
0-1	Cd	1.2
	Hg	0.11
	Pb	35
	Zn	68
	NA (TDGCL, CLC2A)	
	Hg	0.091
	NA (TDGCL, CLC2A)	
	Hg	0.081
	NA (TDGCL, CLC2A)	
	Cd	1.1
	Hg	0.094
	NA (TDGCL, CLC2A)	
14-15	CHCL3	1
	Hg	0.14
	NA (TDGCL, CLC2A)	
19-20	As	3.0
	Cd	1.2
	Cr	29
	Hg	0.085
	Pb	28
	Zn	84
35.5-36.5	As	3.0
	Cd	2.0
	Hg	0.088
	Pb	25
	Zn	85
002606DJ36	As	2.9
	Cr	28
	Hg	0.12
	Pb	28
	Zn	81
	Hg	0.082
	MPA	62
	Hg	0.082
	Hg	0.081
	BIL	

002606DJ34

0-1	As	5.2
	BCHPD	1
	CHCL3	3
	CLC2A	280
	CPMS	50
	CPMSO2	10
	CU	150
	DCPD (VO)	3
	DCPD (SVO)	30
	DLDNR	40
	Hg	0.090
	MPA	580
	ISODR	20
	MEC6H5	5
	Pb	32
	TDGCL	36
4-5	As	4.3
	CHCL3	2
	CLC2A	540
	CPMSO	2
	CPMSO2	4
	CU	63
	Hg	0.067
	MPA	510
	MEC6H5	0.9
	TDGCL	570
9-10	As	2.8
	CHCL3	2
	CLC2A	3300
	Hg	0.099
	MPA	650
	MEC6H5	0.3
	Pb	26
	TDGCL	390
14-15	CLC2A	130
	Hg	0.057
	MPA	100
19-20	CHCL3	0.8
	CLC2A	210
	Hg	0.080
	MPA	9.4
28.8-29.8	CLC2A	620
	MPA	160
	TDGCL	7.8
36-37	111TCE	0.6
	CLC2A	850
	CPMSO2	0.3
	MPA	290
002606DJ35	0-1	ALDRN 4
	CPMSO2	4
	CU	510
	Hg	0.084
	MPA	28
4-5	Cd	2.1
	CPMSO2	4
9-10	CLC2A	80
	CPMSO	2
	CPMSO2	5
	DIMP	2
	Hg	0.34
	MPA	140
14-15	CLC2A	210
	CPMSO2	0.7
	DIMP	2
	Hg	0.047
	MPA	380
	TDGCL	14
	Zn	91
19-20	CPMSO2	0.4
	Hg	0.053
	MPA	130
29-30	Hg	0.043
	MPA	27
35.5-36.5	Hg	0.051
002606DJ36	4-5	As 3.9
	CLC2A	930
	CPMSO2	20
	DCPD (VO)	800
	DCPD (SVO)	3000
	DLDNR	2
	Hg	0.048
	MPA	1900
	MEC6H5	200
	TDGCL	25

002606DJ37

4-5	ALDRN	2000
	As	5.3
	CPMSO2	0.8
	CU	120
	DCPD (VO)	200
	DCPD (SVO)	2000
	DLDNR	40
	Hg	0.034
	MPA	700
	ISODR	1000
	MEC6H5	60
	NA (TDGCL, CLC2A)	
002606DJ38	4-5	As 5.4
	CLC2A	7900
	CPMSO2	20
	CU	1100
	DBCP (SVO)	20
	DCPD (VO)	2000
	DLDNR	400
	Hg	0.072
	MPA	4600
	MEC6H5	2000
	TDGCL	120
002606DJ39	4-5	As 4.9
	CLC2A	6000
	CPMSO2	20
	CU	1100
	DCPD (VO)	1000
	DCPD (SVO)	2000
	DLDNR	500
	Hg	0.063
	MPA	4000
	ISODR	1000
	MEC6H5	1000
002606DJ40	0-1	ALDRN 1
	As	2.6
	CLC2A	760
	CPMSO2	0.5
	Cr	30
	CU	1000
	DCPD (VO)	4
	DIMP	2
	DLDNR	0.8
	MPA	150
	ISODR	0.4
	Zn	78
4-5	As	3.4
	DIMP	2
	MPA	15
9-10	Cr	30
	MPA	4.8
	Zn	78
14-15	BIL	
19-20	BIL	
29-30	BIL	
35.5-36.5	MPA	4.9
4617	0-1	CPMSO2 0.8
	CU	22
	Zn	320
4-5	CU	25
4618	0-1	ALDRN 0.7
	CPMSO2	20
	CU	140
3-3.5	ALDRN	1
	CPMSO2	0.7
	CU	28

4619

0.5-1.5	As	8.9
	Cr	28
	DMMP	3
	Zn	88
4-5	As	6.2
9-10	As	4.9
4620	0.5-1.5	ALDRN 1000
	As	9.3
	BCHPD	8
	C6H6	2
	CPMSO2	20
	Cr	28
	DIMP	0.8
	DMDS	10
	DMMP	20
	DCPD	2000
	DLDNR	400
	ENDNR	900
	ISODR	3000
	MEC6H5	800
	TCLEE	5
	Zn	67
4-5	ALDRN	800
	BCHPD	4
	CU	23
	DBCP	0.04
	DCPD	1000
	DLDNR	200
	ENDNR	500
	ISODR	1000
	MEC6H5	300
	TCLEE	10
9-10	ALDRN	2000
	BCHPD	5
	C6H6	3
	CU	26
	12DCLE	1
	DBCP	3
	DCPD	4000
	DLDNR	400
	ENDNR	800
	ISODR	3000
	MEC6H5	1000
	MEK	0.4
	TCLEE	40
14-15	ALDRN	500
	DCPD	300
	DBCP	0.5
	DLDNR	100
	ENDNR	300
	ISODR	700
	MEC6H5	100
	TCLEE	6
19-20	ALDRN	900
	BCHPD	2
	DBCP	0.08
	DCPD	600
	DLDNR	200
	ENDNR	400
	ISODR	1000
	MEC6H5	300
	TCLEE	20
4621	0.5-1.5	As 9.6
	Zn	81
4-5	As	14
	Cd	2.0
4622	0-0.5	As 10
	Cr	34
	Zn	96
	NA (VO)	
	NA (SVO)	
4-5	CU	28
4623	0-1	BIL
	4-5	BIL
4624	0-1	As 6.6
	CPMSO2	2
	4-5	As 5.2

4625

0.5-1.5	As	NA(SVO)
4-5	As	NA(SVO)
9-10	As	111TCE
	CU	
	Zn	NA(SVO)
4626	0-1	ALDRN
	As	BCHPD
	CHCL3	CLC6H5
	CPMS	CPMSO
	CPMSO	CPMSO2
	Cr	CU
	CU	130MB
	DBCP	DCPD
	DLDNR	DLDNR
	DMDS	DMMP
	DMMP	ENDNR
	ENDNR	ETC6H5
	ETC6H5	Hg
	Hg	ISODR
	ISODR	MEC6H5
	MEC6H5	TCLEE
	TCLEE	Zn
4-5	ALDRN	As
	As	BCHPD
	BCHPD	C6H6
	C6H6	CHCL3
	CHCL3	CLC6H5
	CLC6H5	CPMS
	CPMS	CPMSO
	CPMSO	CPMSO2
	CPMSO2	CU
	CU	DBCP
	DBCP	DCPD
	DCPD	DLDNR
	DLDNR	DMDS
	DMDS	DMMP
	DMMP	ENDNR
	ENDNR	ETC6H5
	ETC6H5	ISODR
	ISODR	MEC6H5
	MEC6H5	TCLEE
	TCLEE	KYLEN
	KYLEN	Zn
4627	0-1	As
	CHCL3	CPMS
	CPMS	CPMSO
	CPMSO	CPMSO2
	CPMSO2	Cr
	Cr	CU
	CU	DBCP
	DBCP	MEC6H5
	MEC6H5	TCLEE
	TCLEE	Zn
4-5	As	CPMSO
	CPMSO	CPMSO2
9-10	As	CPMSO
	CPMSO	CPMSO2
	CPMSO2	Zn
4628	0-1	As
	CPMSO2	Cr
	Cr	Pb
4-5	As	NA (SVO)

(2)

4625	3-5-1.5	As	6.6
	4-5	As	10
	9-10	As	18
		Cu	20
		111TCE	0.4
		Zn	73
		NA(SVO)	

4626	0-1	ALDRN	3000
		As	15
		BCHPD	30
		CHCL3	4
		CLC6H5	0.8
		CPMS	400
		CPMSO	70
		CPMSO2	300
		Cr	31
		Cu	2300
		130MB	5
		DBCP	5
		DCPD	30
		DLDRN	700
		DMDS	2
		DMMP	9
		ENDRN	90
		ETC6H5	1
		Hg	0.08
		ISODR	100
		MEC6H5	>25
		TCLEE	20
		Zn	90
	4-5	ALDRN	4000
		As	9.2
		BCHPD	>25
		C6H6	1
		CHCL3	70
		CLC6H5	5
		CPMS	700
		CPMSO	4
		CPMSO2	90
		Cu	290
		DBCP	8
		DCPD	100
		DLDRN	2000
		DMDS	70
		DMMP	70
		ENDRN	200
		ETC6H5	8
		ISODR	300
		MEC6H5	600
		TCLEE	>25
		XYLEN	10
		Zn	81

4627	0-1	As	14
		CHCL3	0.3
		CPMS	6
		CPMSO	10
		CPMSO2	30
		Cr	29
		Cu	24
		DBCP	0.9
		MEC6H5	1
		TCLEE	1
		Zn	81
	4-5	As	4.8
		CPMSO	5
		CPMSO2	10
		Zn	98
	9-10	As	12
		CPMSO	5
		CPMSO2	8
		Zn	180

4628	0-1	As	9.1
		CPMSO2	0.8
		Cr	28
		Pb	35
	4-5	As	7.8
		NA(SVO)	

4629	0-1	CPMSO2	1
		Cu	24
		Zn	77
	4-5	As	
	9-10	As	
	14-15	Cu	28
	19-20	Cu	28
		130MB	0.4
	29-29.75	Cu	28
		Zn	65
	39-39.25	MEBK	1

4630	0-1	CPMSO2	0.7
		DMMP	4
	4-5	As	11
		CPMSO2	0.5
		DIMP	0.5
		DMMP	6
	9-10	BIL	

4639	0-7	Cu	370
		Hg	0.09
		Aldrin	100
		Dieldrin	90
		Endrin	10
		Isodrin	1
		CPMS	0.5
		CPMSO	1
		CPMSO2	0.4
	1-7	As	6.9
		CPMSO	2
	2-4	Cr	28
		As	7.4
		DIMP	2
		CPMSO	0.6
		CPMSO2	

4640	0-1	CPMS	3
		CPMSO2	5
		NA(SVO)	
	3-4	CPMSO	0.8
		CPMSO2	5
		Cu	180
		DMMP	6
		NA(SVO)	

4641	0-1	CPMSO2	6
		Cu	120
		DIMP	0.5
		DLDRN	1
		NA(SVO)	
	2-3	CPMSO2	2
		Cu	360
		DLDRN	0.9
		NA(SVO)	

4642	0-1	CPMSO2	3
		Cu	60
		NA(SVO)	
	2-3	Cu	25
		NA(SVO)	

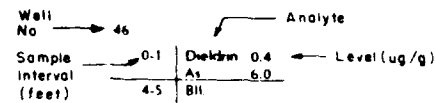
4643	0-1	ALDRN	40
		CPMSO2	70
		Cu	120
		DCPD	80
		DLDRN	30
		ISODR	10
		Zn	65
		NA(SVO)	

4644	0-1	ALDRN	100
		CPMS	100
		CPMSO	1
		CPMSO2	10
		Cu	230
		DCPD	6
		DLDRN	80
		DMMP	8
		ENDRN	100
		ISODR	10
		Zn	66
		NA(SVO)	
	2-3	ALDRN	40
		CPMS	20
		CPMSO	0.6
		CPMSO2	4
		Cu	240
		DCPD	0.4
		DIMP	2
		DLDRN	20
		DMMP	5
		ENDRN	20
		ISODR	2
		NA(SVO)	

4645	0-1	ALDRN	5
		CPMSO2	6
		Cu	240
		DIMP	0.6
		DLDRN	6
		ENDRN	2
		NA(SVO)	
	2-3	ALDRN	20
		CPMS	5
		CPMSO	1
		CPMSO2	5
		Cu	340
		DIMP	0.7
		DLDRN	10
		ENDRN	5
		NA(SVO)	

4646	0-1	CPMSO2	4
		Cu	63
		DLDRN	0.9
		NA(SVO)	
	2-3	CPMSO2	1
		Cu	69
		DIMP	1
		DLDRN	0.5
		NA(SVO)	

Legend



HIL: Below indicator level

NA = Not Analyzed

VOLATILE ORGANIC COMPOUNDS	(VO)
1,2-Dichloroethane	120CLE
1,1,1-Trichloroethane (TCA)	111TCE
Benzene	C6H6
Bicycloheptacene	BCHPD
Chlorobenzene	CHCL3
Chloroform	CHCL3
Dibromochloropropane	DBCP
Dicyclopentadiene	DCPD
Dimethylsulfide	DMDS
Ethylbenzene	ETC6H5
m-Xylene	130MB
Methylene chloride	CH2CL2
Methylisobutyl ketone	MBK
o,p-Xylene	XYLEN
Tetrachloroethene (PCE)	TCLEE
Toluene	MEC6H5

SEMIVOLATILE ORGANIC COMPOUNDS	(SVO)
Aldrin	ALDRN
Chlorophenylmethyl sulfide	CPMS
Chlorophenylmethyl sulfoxide	CPMSO
Chlorophenylmethyl sulfone	CPMSO2
Dibromochloropropane	DBCP
Dicyclopentadiene	DCPD
Dieldrin	DLDRN
Dimethylmethyl phosphonate	DIMP
Dimethylmethyl phosphonate	DMMP
Isodrin	ISODR
Endrin	ENDRN

METALS/ICP	
Cadmium	Cd
Chromium	Cr
Copper	Cu
Lead	Pb
Zinc	Zn

SEPARATE ANALYSES	
Arsenic	As
Mercury	Hg

ARMY DEGRADATION PRODUCTS	
Chloroacetic Acid	CLC2A
Thiodiglycol	TDGCL
Isopropylmethylphosphonic Acid	IMPA

NOTES

1. Depths of all samples are reported in feet and are referenced to the asphalt liner.
2. Data presented for Phase II investigation are preliminary data that have not been validated to Level 2 status.

Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

FIGURE NCSA-3-2

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by Ebasco Services Incorporated

TABLE NCSA-3-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-3

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	4000	4-5	4626	4000	4-5	4626
Benzene	3	9-10	4620	3	9-10	4620
Bicycloheptadiene	30	0-1	4626	30	0-1	4626
Chloroacetic acid	7900	4-5	DJ38	7900	4-5	DJ38
Chlorobenzene	5	4-5	4626	5	4-5	4626
Chloroform	70	4-5	4626	70	4-5	4626
Chlorophenylmethyl sulfide	700	4-5	4626	700	4-5	4626
Chlorophenylmethyl sulfone	300	0-1	4626	300	0-1	4626
Chlorophenylmethyl sulfoxide	70	0-1	4626	70	0-1	4626
Dibromochloropropane	20	4-5	DJ38	20	4-5	DJ38
1,2-Dichloroethane	1	9-10	4620	1	9-10	4620
Dicyclopentadiene	4000	4-5	4620	4000	4-5	4620
Dieldrin	2000	4-5	4626	2000	4-5	4626
Diisopropylmethyl phosphonate	3	1-2	DJ16	3	1-2	DJ16
		4-5	DJ12		4-5	DJ12
Dimethyldisulfide	70	4-5	4626	70	4-5	4626
Dimethylmethyl phosphonate	70	4-5	4626	70	4-5	4626
Endrin	900	0.5-1.5	4620	900	0.5-1.5	4620
Ethylbenzene	8	4-5	4626	8	4-5	4626
Hexachlorobutadiene ^{1/}	90	4-5	DJ38	90	4-5	DJ38
Isodrin	3000	0.5-1.5	4620	3000	0.5-1.5	4620
		9-10	4620		9-10	4620
Isopropylmethylphosphonic acid	4600	4-5	DJ38	4600	4-5	DJ38
Methylene chloride	--	--	--	3	36.5-37.5	DJ20
Methylisobutyl ketone	0.4	9-10	4620	1	38-39.25	4629
Oxybisethanol ^{1/}	0.50	4-5	4621	0.50	4-5	4621

TABLE NCSA-3-1 (Continued)
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-3

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Tetrachlorobenzene ^{1/}	10	0.5-1.5	4620	10	0.5-1.5	4620
1,1,2,2-Tetrachloroethane ^{1/}	30	0-1	4643	30	0-1	4643
Tetrachloroethylene	40	9-10	4620	40	9-10	4620
Thiodiglycol	570	4-5	DJ34	570	4-5	DJ34
Toluene	2000	4-5	DJ38	2000	4-5	DJ38
1,1,1-Trichloroethane	0.4	9-10	2625	0.6	36-37	DJ34
m-Xylene	5	0-1	4626	5	0-1	4626
o-p-Xylene	10	4-5	4626	10	4-5	4626
Arsenic	48	1-2	DJ28	--	--	--
Cadmium	2.3	0-1	DJ32	--	--	--
Copper	2300	0-1	4626	--	--	--
Mercury	0.34	9-10	DJ35	--	--	--
Zinc	320	0-1	4617	--	--	--

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-3-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-3

AVERAGE SITE DEPTH TO GROUNDWATER: 48 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	3.7	26041	02/3/88
1,2-DICHLOROETHANE	95	26041	09/17/87
M-XYLENE	2.2	26017	07/26/88
ALDRIN	0.77	26011	01/13/88
ATRAZINE	130	26041	11/17/88
BICYCLOHEPTADIENE	16	26041	11/17/88
BENZOTHAZOLE	270	26041	02/3/88
BENZENE	19	26041	02/9/89
CHLOROFORM	9.6	26015	05/3/88
HEXACHLOROCYCLOPENTADIENE	2.4	26041	11/17/88
CHLOROBENZENE	6.4	26015	05/3/88
CHLORDANE	63	26041	02/9/89
CHLOROPHENYLMETHYL SULFIDE	31	26041	02/3/88
CHLOROPHENYLMETHYL SULFOXIDE	400	26041	11/17/88
CHLOROPHENYLMETHYL SULFONE	760	26041	02/3/88
DIBROMOCHLOROPROPANE	0.24	26041	02/9/89
DICYCLOPENTADIENE	54	26041	02/9/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALY
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-3-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-3

AVERAGE SITE DEPTH TO GROUNDWATER: 48 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
VAPONA	2.8	26015	11/14/88
DIISOPROPYLMETHYL PHOSPHONATE	3900	26041	09/17/87
DITHIANE	77	26041	02/3/88
DIELDRIN	1.8	26041	11/17/88
DIMETHYL DISULFIDE	4.4	26041	11/17/88
DIMETHYLMETHYL PHOSPHONATE	14000	26041	02/4/88
ENDRIN	0.41	26041	02/9/89
ETHYLBENZENE	5.1	26041	11/17/88
ISODRIN	12	26041	02/3/88
TOLUENE	140	26041	09/17/87
METHYLISOBUTYL KETONE	16	26041	11/17/88
MALATHION	7.4	26041	11/17/88
1,4-OXATHIANE	190	26041	11/17/88
PPDDE	1.5	26041	07/26/88
PPDDT	1.5	26041	11/17/88
SUPONA	20	26041	11/17/88
TETRACHLOROETHYLENE	1.3	26015	05/3/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYT
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-3-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-3

AVERAGE SITE DEPTH TO GROUNDWATER: 48 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
TRICHLOROETHYLENE	5.4	26041	02/3/88
O,P-XYLENE	22	26041	05/4/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYT
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-3-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	2.7E+03*	1.4E-04a	2.7E+03*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-15
BENZENE	8.6E+02	4.4E+05	8.6E+02	3.5E-03	6.9E-06	3.5E-03	7.0E-08
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-10
BICYCLOHEPTADIENE	3.2E+05	1.2E+08	3.2E+05	9.4E-05	2.5E-07	9.5E-05	4.6E-10
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	8.6E-09
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	4.8E-01*	0.0E+00	4.8E-01*	0.0E+00
CHLOROBENZENE	1.6E+05	4.8E+07	1.6E+05	3.1E-05	1.0E-07	3.1E-05	2.0E-10
CHLOROFORM	4.0E+03	5.1E+05	4.0E+03	1.7E-02	1.4E-04	1.7E-02	5.3E-09
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	1.0E+06	1.6E+05	4.3E-03	3.9E-07a	4.3E-03	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.0E+06	1.6E+05	1.8E-03	6.4E-07a	1.8E-03	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	2.9E+08	1.6E+05	4.3E-04	2.4E-07	4.3E-04	1.2E-11
PPDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-10
PPDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-09
DIBROMOCHLOROPROPANE	1.8E+01	2.8E+04	1.8E+01	1.1E+00*	7.2E-04	1.1E+00*	1.8E-09
1,2-DICHLOROETHANE	2.8E+02	3.2E+05	2.8E+02	3.6E-03	3.1E-06	3.6E-03	1.9E-07
DICYCLOPENTADIENE	5.4E+04	1.0E+06	5.1E+04	7.4E-02	4.6E-03a	7.8E-02	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.3E+03*	1.5E-04a	1.3E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.1E+08	6.6E+05	4.5E-06	2.7E-08	4.6E-06	3.3E-10
DIMETHYLDISULFIDE	6.7E+04	7.7E+07	6.7E+04	1.0E-03	9.1E-07	1.0E-03	1.5E-10
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	4.7E-04	0.0E+00	4.7E-04	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-01*	8.4E-08a	3.6E-01*	0.0E+00
ETHYLBENZENE	8.3E+05	9.5E+08	8.3E+05	9.7E-06	8.4E-09	9.7E-06	1.3E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.6E-08
ISODRIN	5.8E+02	1.0E+06	5.8E+02	5.2E+00*	1.4E-06a	5.2E+00*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	1.9E-03	0.0E+00	1.9E-03	0.0E+00
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-15
METHYLISOBUTYL KETONE	4.1E+05	5.0E+07	4.1E+05	9.8E-07	2.0E-08	1.0E-06	3.9E-12
METHYLENE CHLORIDE	3.3E+03	5.5E+06	3.3E+03	0.0E+00	5.5E-07	5.5E-07	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SIPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-15
1,1,2,2-TETRACHLOROETHANE	1.3E+02	5.8E+05	1.3E+02	2.4E-01*	5.2E-05	2.4E-01*	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	2.3E+06	5.1E+02	7.8E-02	1.7E-05	7.8E-02	2.2E-09
THIODIGLYCOL	3.3E+05	0.0E+00	3.3E+05	1.7E-03	0.0E+00	1.7E-03	0.0E+00
TOLUENE	2.5E+06	1.0E+06	2.5E+06	8.0E-04	5.3E-07a	8.0E-04	0.0E+00
1,1,1-TRICHLOROETHANE	7.5E+05	6.7E+08	7.5E+05	5.4E-07	8.9E-10	5.4E-07	8.2E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-08
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.8E-12
M-XYLENE	1.4E+07	2.8E+08	1.4E+07	3.5E-07	1.8E-08	3.7E-07	7.8E-12
O,P-XYLENE	1.4E+07	2.8E+08	1.4E+07	7.0E-07	3.6E-08	7.4E-07	7.6E-11

NCSA-3-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.2E+00*	0.0E+00	2.2E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	5.1E-03	0.0E+00	5.1E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	5.5E-03	0.0E+00	5.5E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.0E-04	0.0E+00	1.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	1.6E-04	0.0E+00	1.6E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-3-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	2.7E+03*	1.4E-04a	2.7E+03*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-15
BENZENE	8.6E+02	4.4E+05	8.6E+02	3.5E-03	6.9E-06	3.5E-03	7.0E-08
BENZOTHIADIAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-10
BICYCLOHEPTADIENE	3.2E+05	1.2E+08	3.2E+05	9.4E-05	2.5E-07	9.5E-05	4.6E-10
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	8.6E-09
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	4.8E-01*	0.0E+00	4.8E-01*	0.0E+00
CHLOROBENZENE	1.6E+05	4.8E+07	1.6E+05	3.1E-05	1.0E-07	3.1E-05	2.0E-10
CHLOROFORM	4.0E+03	5.1E+05	4.0E+03	1.7E-02	1.4E-04	1.7E-02	5.3E-09
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	1.0E+06	1.6E+05	4.3E-03	3.9E-07a	4.3E-03	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.0E+06	1.6E+05	1.8E-03	6.4E-07a	1.8E-03	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	2.9E+08	1.6E+05	4.3E-04	2.4E-07	4.3E-04	1.2E-11
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-09
DIBROMOCHLOROPROPANE	1.8E+01	2.8E+04	1.8E+01	1.1E+00*	7.2E-04	1.1E+00*	1.8E-09
1,2-DICHLOROETHANE	2.8E+02	3.2E+05	2.8E+02	3.6E-03	3.1E-06	3.6E-03	1.9E-07
DICYCLOPENTADIENE	5.4E+04	1.0E+06	5.1E+04	7.4E-02	4.6E-03a	7.8E-02	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	1.3E+03*	1.5E-04a	1.3E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.1E+08	6.6E+05	4.5E-06	2.7E-08	4.6E-06	3.3E-10
DIMETHYLDISULFIDE	6.7E+04	7.7E+07	6.7E+04	1.0E-03	9.1E-07	1.0E-03	1.5E-10
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	4.7E-04	0.0E+00	4.7E-04	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-01*	8.4E-08a	3.6E-01*	0.0E+00
ETHYLBENZENE	8.3E+05	9.5E+08	8.3E+05	9.7E-06	8.4E-09	9.7E-06	1.3E-11
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.6E-08
ISODRIN	5.8E+02	1.0E+06	5.8E+02	5.2E+00*	1.4E-06a	5.2E+00*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	1.9E-03	0.0E+00	1.9E-03	0.0E+00
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-15
METHYLISOBUTYL KETONE	4.1E+05	5.0E+07	4.1E+05	9.8E-07	2.0E-08	1.0E-06	3.9E-12
METHYLENE CHLORIDE	3.3E+03	5.5E+06	3.3E+03	0.0E+00	5.5E-07	5.5E-07	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-15
1,1,2,2-TETRACHLOROETHANE	1.3E+02	5.8E+05	1.3E+02	2.4E-01*	5.2E-05	2.4E-01*	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	2.3E+06	5.1E+02	7.8E-02	1.7E-05	7.8E-02	2.2E-09
THIODIGLYCOL	3.3E+05	0.0E+00	3.3E+05	1.7E-03	0.0E+00	1.7E-03	0.0E+00
TOLUENE	2.5E+06	1.0E+06	2.5E+06	8.0E-04	5.3E-07a	8.0E-04	0.0E+00
1,1,1-TRICHLOROETHANE	7.5E+05	6.7E+08	7.5E+05	5.4E-07	8.9E-10	5.4E-07	8.2E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-08
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.8E-12
M-XYLENE	1.4E+07	2.8E+08	1.4E+07	3.5E-07	1.8E-08	3.7E-07	7.8E-12
O,P-XYLENE	1.4E+07	2.8E+08	1.4E+07	7.0E-07	3.6E-08	7.4E-07	7.6E-11

NCSA-3-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	2.2E+01	0.0E+00	2.2E+01	2.2E+00*	0.0E+00	2.2E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	5.1E-03	0.0E+00	5.1E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	5.5E-03	0.0E+00	5.5E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.0E-04	0.0E+00	1.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	1.6E-04	0.0E+00	1.6E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-3-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.0E+06	2.1E-01	1.9E+04*	2.1E-03a	1.9E+04*	0.0E+00
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-14
BENZENE	1.2E+02	6.8E+04	1.2E+02	2.5E-02	4.4E-05	2.5E-02	1.1E-06
BENZOTHIADIAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.7E-09
BICYCLOHEPTADIENE	1.4E+05	4.4E+07	1.4E+05	2.2E-04	6.8E-07	2.2E-04	3.0E-09
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-07
CHLOROACETIC ACID	7.0E+03	0.0E+00	7.0E+03	1.1E+00*	0.0E+00	1.1E+00*	0.0E+00
CHLOROBENZENE	6.8E+04	1.7E+07	6.8E+04	7.3E-05	2.9E-07	7.3E-05	1.3E-09
CHLOROFORM	5.6E+02	7.9E+04	5.6E+02	1.2E-01*	8.9E-04	1.3E-01*	7.9E-08
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	1.0E+06	7.0E+04	1.0E-02	1.0E-05a	1.0E-02	0.0E+00
CHLOROPHENYLMETHYL SULFONE	7.0E+04	1.0E+06	7.0E+04	4.3E-03	4.1E-06a	4.3E-03	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	4.5E+07	7.0E+04	1.0E-03	1.6E-06	1.0E-03	7.5E-11
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	6.3E-09
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-08
DIBROMOCHLOROPROPANE	2.5E+00	1.8E+03	2.5E+00	8.0E+00*	1.1E-02	8.0E+00*	2.8E-08
1,2-DICHLOROETHANE	3.9E+01	4.9E+04	3.9E+01	2.6E-02	2.0E-05	2.6E-02	2.9E-06
DICYCLOPENTADIENE	1.8E+04	3.8E+04	1.2E+04	2.2E-01*	1.1E-01*	3.2E-01*	0.0E+00
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	9.2E+03*	2.3E-03a	9.2E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	1.1E+08	2.8E+05	1.1E-05	2.7E-08	1.1E-05	2.1E-09
DIMETHYLDISULFIDE	2.9E+04	2.8E+07	2.8E+04	2.5E-03	2.5E-06	2.5E-03	9.5E-10
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	1.1E-03	0.0E+00	1.1E-03	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	8.5E-01*	5.4E-07a	8.5E-01*	0.0E+00
ETHYLBENZENE	3.5E+05	3.4E+08	3.5E+05	2.3E-05	2.3E-08	2.3E-05	8.4E-11
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	4.9E-07
ISODRIN	2.5E+02	1.0E+06	2.5E+02	1.2E+01*	9.2E-06a	1.2E+01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.1E+06	0.0E+00	1.1E+06	4.4E-03	0.0E+00	4.4E-03	0.0E+00
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	8.0E-15
METHYLISOBUTYL KETONE	1.7E+05	7.8E+06	1.7E+05	2.3E-06	1.3E-07	2.4E-06	2.5E-11
METHYLENE CHLORIDE	4.5E+02	8.5E+05	4.5E+02	0.0E+00	3.5E-06	3.5E-06	0.0E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-14
1,1,2,2-TETRACHLOROETHANE	1.8E+01	9.0E+04	1.8E+01	1.7E+00*	3.3E-04	1.7E+00*	0.0E+00
TETRACHLOROETHYLENE	7.1E+01	3.5E+05	7.1E+01	5.6E-01*	1.1E-04	5.6E-01*	3.3E-08
THIODIGLYCOL	1.4E+05	0.0E+00	1.4E+05	4.0E-03	0.0E+00	4.0E-03	0.0E+00
TOLUENE	1.1E+06	1.0E+06	1.1E+06	1.9E-03	5.8E-06a	1.9E-03	0.0E+00
1,1,1-TRICHLOROETHANE	3.2E+05	2.4E+08	3.2E+05	1.3E-06	2.5E-09	1.3E-06	5.3E-11
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-07
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	5.7E-11
M-XYLENE	5.8E+06	1.0E+08	5.5E+06	8.6E-07	4.9E-08	9.1E-07	5.0E-11
O,P-XYLENE	5.8E+06	1.0E+08	5.5E+06	1.7E-06	9.8E-08	1.8E-06	4.9E-10

NCSA-3-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	3.9E+00	0.0E+00	3.9E+00	1.2E+01*	0.0E+00	1.2E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	4.0E-02	0.0E+00	4.0E-02	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	9.3E-03	0.0E+00	9.3E-03	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	1.7E-04	0.0E+00	1.7E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	3.0E-04	0.0E+00	3.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-3-6

EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	2.1E+03*	3.2E+01*	2.1E+03*	0.0E+00
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-09
BENZENE	1.1E+03	1.3E+00	1.3E+00	2.8E-03	2.2E+00*	2.2E+00*	2.0E-02
BENZOTHIADIAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-04
BICYCLOHEPTADIENE	1.8E+05	8.6E+01	8.6E+01	1.7E-04	3.5E-01*	3.5E-01*	4.0E-04
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	2.5E-03
CHLOROACETIC ACID	9.2E+03	0.0E+00	9.2E+03	8.6E-01*	0.0E+00	8.6E-01*	0.0E+00
CHLOROBENZENE	8.8E+04	5.3E+02	5.3E+02	5.7E-05	9.4E-03	9.4E-03	1.8E-04
CHLOROFORM	5.1E+03	2.4E+00	2.4E+00	1.4E-02	2.9E+01*	2.9E+01*	1.5E-03
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	2.1E+03	2.1E+03	7.7E-03	3.3E-01*	3.4E-01*	0.0E+00
CHLOROPHENYLMETHYL SULFONE	9.1E+04	6.8E+02	6.7E+02	3.3E-03	4.4E-01*	4.5E-01*	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	4.2E+02	4.1E+02	7.7E-04	1.7E-01*	1.7E-01*	1.0E-05
PPDOE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-04
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	8.8E-04
DIBROMOCHLOROPROPANE	2.3E+01	1.2E-01	1.2E-01	8.9E-01*	1.7E+02*	1.7E+02*	5.3E-04
1,2-DICHLOROETHANE	3.5E+02	4.6E-01	4.6E-01	2.8E-03	2.2E+00*	2.2E+00*	5.6E-02
DICYCLOPENTADIENE	1.7E+04	1.3E+00	1.3E+00	2.3E-01*	3.2E+03*	3.2E+03*	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+03*	3.5E+01*	1.0E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	8.2E-06	1.8E-02	1.8E-02	2.8E-04
DIMETHYLDISULFIDE	3.7E+04	8.6E+02	8.4E+02	1.9E-03	8.1E-02	8.3E-02	1.3E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	8.5E-04	0.0E+00	8.5E-04	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	6.5E-01*	5.8E-02*	7.1E-01*	0.0E+00
ETHYLBENZENE	4.6E+05	1.1E+04	1.0E+04	1.7E-05	7.5E-04	7.7E-04	1.1E-05
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	6.5E-02
ISODRIN	3.2E+02	3.0E+03	2.9E+02	9.4E+00*	9.9E-01*	1.0E+01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.4E+06	0.0E+00	1.4E+06	3.3E-03	0.0E+00	3.3E-03	0.0E+00
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-09
METHYLISOBUTYL KETONE	2.2E+05	5.3E+01	5.3E+01	1.8E-06	1.9E-02	1.9E-02	3.4E-06
METHYLENE CHLORIDE	4.1E+03	7.9E+00	7.9E+00	0.0E+00	3.8E-01*	3.8E-01*	0.0E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-09
1,1,2,2-TETRACHLOROETHANE	1.6E+02	3.4E+01	2.8E+01	1.9E-01*	8.9E-01*	1.1E+00*	0.0E+00
TETRACHLOROETHYLENE	6.5E+02	4.9E+00	4.9E+00	6.2E-02	8.1E+00*	8.2E+00*	6.3E-04
THIODIGLYCOL	1.8E+05	0.0E+00	1.8E+05	3.1E-03	0.0E+00	3.1E-03	0.0E+00
TOLUENE	1.4E+06	5.5E+03	5.4E+03	1.4E-03	3.7E-01*	3.7E-01*	0.0E+00
1,1,1-TRICHLOROETHANE	4.2E+05	3.2E+02	3.2E+02	9.6E-07	1.9E-03	1.9E-03	7.1E-06
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	5.0E-03
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-06
M-XYLENE	7.0E+06	3.0E+03	3.0E+03	7.2E-07	1.7E-03	1.7E-03	6.7E-06
O,P-XYLENE	7.0E+06	3.0E+03	3.0E+03	1.4E-06	3.4E-03	3.4E-03	6.6E-05

NCSA-3-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ARSENIC	2.0E+01	0.0E+00	2.0E+01	2.4E+00*	0.0E+00	2.4E+00*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	6.4E-03	0.0E+00	6.4E-03	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	1.3E-02	0.0E+00	1.3E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	2.4E-04	0.0E+00	2.4E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	4.1E-04	0.0E+00	4.1E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-3-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	3.9E+06	4.2E+01	1.2E-01	3.4E+04*	9.5E+01*	3.4E+04*	0.0E+00	0.0E+00
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-14	1.4E-09
BENZENE	6.7E+01	5.8E+04	1.3E+00	1.3E+00	4.5E-02	2.2E+00*	2.3E+00*	5.2E-07	6.0E-02
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.1E-09	3.6E-04
BICYCLOHEPTADIENE	3.3E+04	1.6E+07	2.6E+02	2.6E+02	9.2E-04	1.2E-01*	1.2E-01*	3.4E-09	4.0E-04
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	6.5E-08	7.5E-03
CHLOROACETIC ACID	1.7E+03	0.0E+00	0.0E+00	1.7E+03	4.7E+00*	0.0E+00	4.7E+00*	0.0E+00	0.0E+00
CHLOROBENZENE	1.5E+04	6.4E+06	1.6E+03	1.4E+03	3.3E-04	3.1E-03	3.5E-03	1.5E-09	1.8E-04
CHLOROFORM	3.1E+02	6.8E+04	9.0E-01	8.9E-01	2.2E-01*	7.8E+01*	7.8E+01*	4.0E-08	4.6E-03
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	2.4E+08	6.3E+03	4.6E+03	4.2E-02	1.1E-01*	1.5E-01*	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.7E+04	6.3E+07	6.8E+02	6.5E+02	1.8E-02	4.4E-01*	4.6E-01*	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	3.8E+07	4.2E+02	4.0E+02	4.2E-03	1.7E-01*	1.7E-01*	8.8E-11	1.0E-05
PPDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-09	3.6E-04
PPDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-08	2.6E-03
DIBROMOCHLOROPROPANE	1.4E+00	3.7E+03	4.0E-02	3.9E-02	1.4E+01*	5.0E+02*	5.1E+02*	1.4E-08	1.6E-03
1,2-DICHLOROETHANE	2.2E+01	4.3E+04	4.6E-01	4.5E-01	4.6E-02	2.2E+00*	2.2E+00*	1.4E-06	1.7E-01
DICYCLOPENTADIENE	1.2E+03	1.2E+05	1.8E-01	1.8E-01	3.4E+00*	2.2E+04*	2.2E+04*	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	1.8E+06	1.9E+01	1.2E-01	1.6E+04*	1.0E+02*	1.6E+04*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	1.5E+07	7.2E+02	7.1E+02	4.4E-05	4.2E-03	4.2E-03	2.5E-09	2.8E-04
DIMETHYLDISULFIDE	6.9E+03	1.0E+07	2.6E+03	1.9E+03	1.0E-02	2.7E-02	3.7E-02	1.1E-09	1.3E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	4.6E-03	0.0E+00	4.6E-03	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	3.5E+00*	5.8E-02*	3.6E+00*	0.0E+00	0.0E+00
ETHYLBENZENE	8.5E+04	1.3E+08	3.2E+04	2.3E+04	9.5E-05	2.5E-04	3.5E-04	9.7E-11	1.1E-05
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-07	6.5E-02
ISODRIN	5.9E+01	2.8E+08	3.0E+03	5.8E+01	5.1E+01*	9.9E-01*	5.2E+01*	0.0E+00	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+05	0.0E+00	0.0E+00	2.5E+05	1.8E-02	0.0E+00	1.8E-02	0.0E+00	0.0E+00
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-15	1.1E-09
METHYL ISOBUTYL KETONE	4.0E+04	6.7E+06	5.3E+01	5.3E+01	1.0E-05	1.9E-02	1.9E-02	2.9E-11	3.4E-06
METHYLENE CHLORIDE	2.5E+02	7.3E+05	7.9E+00	7.7E+00	0.0E+00	3.8E-01*	3.8E-01*	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-14	2.3E-09
1,1,2,2-TETRACHLOROETHANE	9.9E+00	7.7E+04	3.4E+01	7.6E+00	3.0E+00*	8.9E-01*	3.9E+00*	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	4.1E+01	3.1E+05	4.9E+00	4.4E+00	9.7E-01*	8.1E+00*	9.1E+00*	1.6E-08	1.9E-03
THIODIGLYCOL	3.4E+04	0.0E+00	0.0E+00	3.4E+04	1.7E-02	0.0E+00	1.7E-02	0.0E+00	0.0E+00
TOLUENE	2.6E+05	5.1E+08	1.6E+03	1.6E+03	7.7E-03	1.2E+00*	1.2E+00*	0.0E+00	0.0E+00
1,1,1-TRICHLOROETHANE	7.8E+04	9.0E+07	9.7E+02	9.6E+02	5.1E-06	6.2E-04	6.2E-04	6.2E-11	7.1E-06
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-07	1.5E-02
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-11	3.2E-06
M-XYLENE	8.8E+05	3.7E+07	6.0E+02	6.0E+02	5.7E-06	8.3E-03	8.3E-03	5.8E-11	6.7E-06
O,P-XYLENE	8.8E+05	3.8E+07	6.0E+02	6.0E+02	1.1E-05	1.7E-02	1.7E-02	5.7E-10	6.6E-05

NCSA-3-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	3.0E+01*	0.0E+00	3.0E+01*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	3.0E-01*	0.0E+00	3.0E-01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	4.0E-02	0.0E+00	4.0E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	7.4E-04	0.0E+00	7.4E-04	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	2.3E-03	0.0E+00	2.3E-03	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.13 SITE NCSA-4a: DEEP DISPOSAL WELL (formerly Site 26-1: Deep Disposal Well and Chemical Sewers; ESE, 1988m/RIC 88103R02 and ESE, 1988n/RIC 88103R02A)

2.13.1 Site-Specific Considerations

Figure NCSA-4a-1 and Tables NCSA-4a-1 and NCSA-4a-2 depict the target contaminants for site NCSA-4a. Borings 4537A through 4549A, 4549B, 4549C, 4549F, 4549G, 4540Z, 4544Y, 4546Y, 4549H, 4546Z, and 4753 through 4767, were included in this exposure assessment, consistent with the North Central SAR. The historical search conducted under the contamination assessment revealed that undocumented amounts of diisopropylmethyl phosphonate, dicyclopentadiene, and chlorophenylmethyl sulfone were detected previously in the vitrified clay pipeline (Z line) and surrounding soil (ESE, 1988m/RIC 88103R02), but were not detected during the Phase I and Phase II investigations. According to site history, no other chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-4a (ESE, 1988m/RIC 88103R02).

2.13.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-4a are shown in Figure NCSA-4a-1. The following contaminants were not included in this figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Phosphoric acid, tributyl ester, occurring in Boring 4546Z (10-11 ft) and pyrene occurring in Boring 4762 (0-1 ft). Although not shown on this figure, these nontarget compounds were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-4a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Dibromochloropropane, tetrachloroethylene, and phosphoric acid, tributyl ester were not detected in the 0-10 ft interval.

Table NCSA-4a-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.13.3 Site Exposure Summary

Tables NCSA-4a-3 through NCSA-4a-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-4a is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Methylene chloride	--	--	--	Indirect	Indirect
Tetrachloroethylene	--	--	--	Indirect	Indirect
Dibromochloropropane	--	--	--	--	Indirect
Isodrin	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

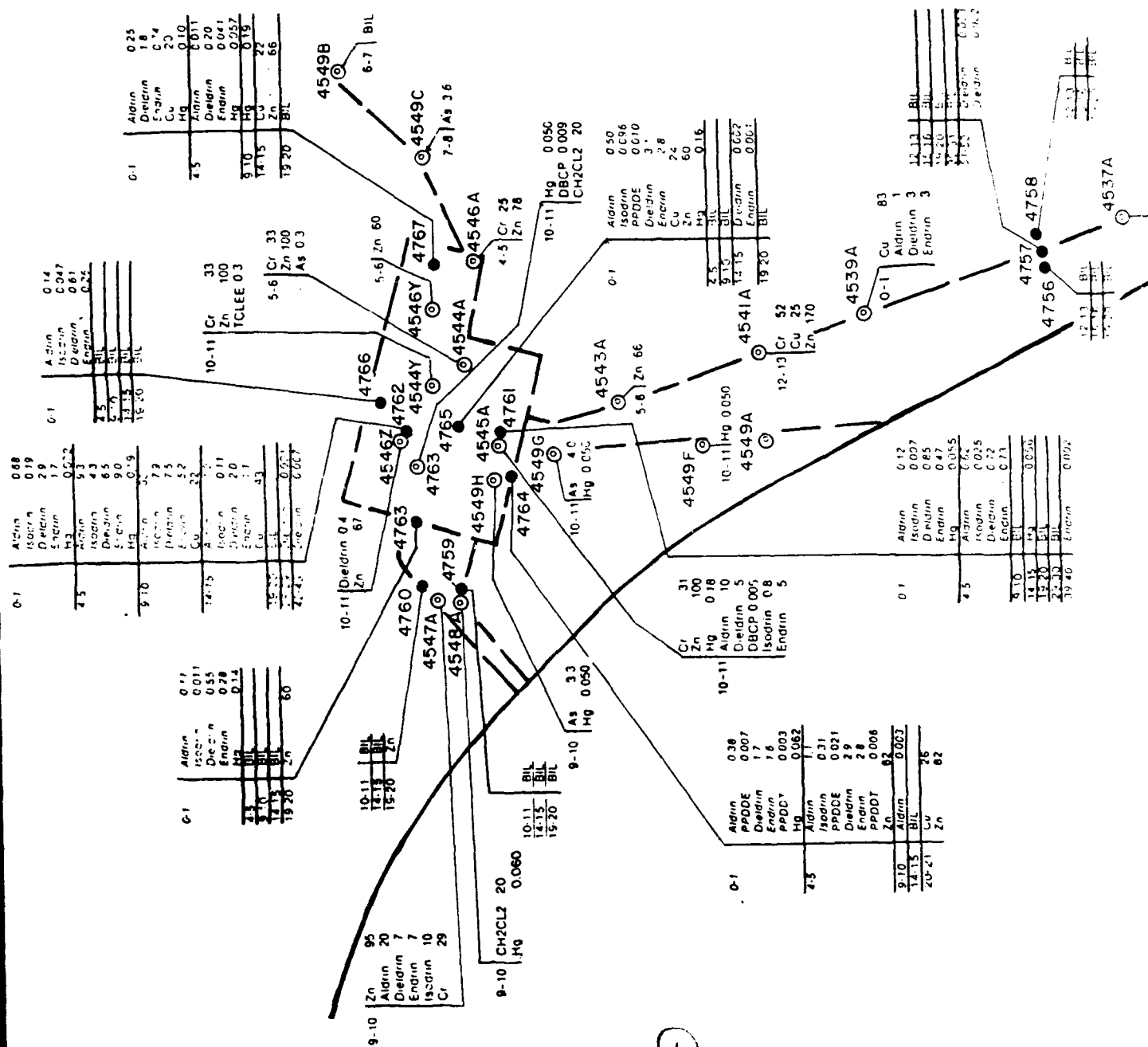
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-4a is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (enclosed)
- Chloroform (enclosed)
- 1,2-Dichloroethane (enclosed)

- Tetrachloroethylene (enclosed)
- Dicyclopentadiene (enclosed)



BASIN F

REL	REL	REL
12.13	16.17	16.20
14.15	16.17	16.20
16.20	16.17	16.20

4537A

10-11 REL

10-11	Cu	20
	Aldrin	3
	Dieldrin	4
	Endrin	1

4538A

6.7	Cr	32
	Cu	20
	Zn	190
	Aldrin	2
	Dieldrin	2
	Endrin	0.7

4540A

4754 4755

10-11	REL	0.06
16.17	Aldrin	0.05
	Dieldrin	0.05
	Endrin	0.02
19.20	Cu	24
	Zn	70

4542A

10-11	REL	0.06
16.17	Aldrin	0.05
	Dieldrin	0.05
	Endrin	0.02
19.20	Cu	24
	Zn	70

4540Z

10-11	REL	0.06
16.17	Aldrin	0.05
	Dieldrin	0.05
	Endrin	0.02
19.20	Cu	24
	Zn	70

5.6	Cr	37
	Cu	24
	Zn	190
	Aldrin	3.8
	Dieldrin	0.4
	Endrin	0.4

10-11	REL	0.06
16.17	Aldrin	0.05
	Dieldrin	0.05
	Endrin	0.02
19.20	Cu	24
	Zn	70

4753

4754

4755

Legend

--- Site Boundary

○ Phase I Boring

● Phase II Boring

Sample Interval -- 0-1 1/2 0.17-level (ug/g)

(iii) 4-5 PPODE 0.0098

7-8 Buttock sample

REL - Below indicator level

- PPDE 2,2-bis(4-chlorophenyl)-1,1-dichloroethane
- PPDDT 2,2-bis(4-chlorophenyl)-1,1-dichloroethane
- DBCP Dibromochloropropane
- CH2CL2 Methylene chloride
- TCLEE Tetrachloroethylene
- Au Arsenic
- Cr Chromium
- Cu Copper
- Hg Mercury
- Zn Zinc

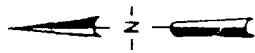


FIGURE NCSA-4a-1

Phase I and Phase II Analytes Detected Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by Ebasco Services Incorporated

Prepared for:

Program Manager's Office for

Rocky Mountain Arsenal Cleanup

Aberdeen Proving Ground, Maryland

Source: HLEA, ERM

TABLE NCSA-4a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-4a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	30	9-10	4762	30	9-10	4762
PPDDE ^{1/}	0.021	4-5	4764	0.021	4-5	4764
PPDDT ^{2/}	0.006	4-5	4764	0.0060	4-5	4764
Dibromochloropropane	--	--	--	0.009	10-11	4763
Dieldrin	7.5	9-10	4762	7.5	9-10	4762
Endrin	9.0	4-5	4762	9.0	4-5	4762
Isodrin	10	9-10	4547A	10	9-10	4547A
Methylene chloride	20	9-10	4548A	20	10-11	4763
Tetrachloroethylene	--	--	--	0.3	10-11	4544Y
Phosphoric acid, tributyl ester ^{3/}	--	--	--	0.8	10-11	4546Z
Pyrene ^{3/}	0.90	0-1	4762	0.90	0-1	4762
Mercury	0.19	4-5	4762	--	--	--
		9-10	4767	--	--	--
Zinc	100	5-6	4544A	--	--	--
		6-7	4540A	--	--	--
		5-6	4540Z	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-4a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4a
AVERAGE SITE DEPTH TO GROUNDWATER: 49 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1-DICHLOROETHANE	6.7	26133	08/11/88
1,2-DICHLOROETHYLENE	14	26133	02/10/89
1,2-DICHLOROETHANE	950	26133	02/10/89
M-XYLENE	13	26133	11/16/88
ALDRIN	0.95	26133	05/4/88
ATRAZINE	8.3	26133	02/10/89
BICYCLOHEPTADIENE	1100	26133	01/21/88
BENZOTHIAZOLE	26	26133	11/16/88
BENZENE	520	26133	08/11/88
METHYLENE CHLORIDE	1300	26133	02/10/89
CHLOROFORM	86000	26133	11/16/88
HEXACHLOROCYCLOPENTADIENE	10	26133	08/11/88
CHLOROBENZENE	19	26133	02/10/89
CHLORDANE	23	26133	02/10/89
CHLOROPHENYLMETHYL SULFIDE	790	26133	05/4/88
CHLOROPHENYLMETHYL SULFOXIDE	200	26133	11/16/88
CHLOROPHENYLMETHYL SULFONE	790	26133	08/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-4a-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4a

AVERAGE SITE DEPTH TO GROUNDWATER: 49 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
DIBROMOCHLOROPROPANE	53	26133	01/21/88
DICYCLOPENTADIENE	1500	26133	01/21/88
DIISOPROPYLMETHYL PHOSPHONATE	1000	26133	11/16/88
DITHIANE	180	26133	11/16/88
DIELDRIN	1.4	26133	08/11/88
DIMETHYL DISULFIDE	7.0	26133	11/16/88
DIMETHYLMETHYL PHOSPHONATE	1300	26133	02/10/89
ENDRIN	1.0	26133	11/16/88
ETHYLBENZENE	13	26133	08/11/88
ISODRIN	0.87	26133	01/21/88
TOLUENE	280	26133	02/10/89
METHYLISOBUTYL KETONE	350	26133	02/10/89
1,4-OXATHIANE	23	26133	11/16/88
PPDDE	0.59	26133	01/21/88
PPDDT	0.54	26133	01/21/88
PARATHION	5.1	26133	11/16/88
TETRACHLOROETHYLENE	1100	26133	05/4/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-4a-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4a

AVERAGE SITE DEPTH TO GROUNDWATER: 49 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
TRICHLOROETHYLENE	100	26133	01/21/88
O,P-XYLENE	75	26133	08/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-4a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPM
ALDRIN	1.5E+00	5.2E+05	1.5E+00	2.0E+01*	5.7E-05	2.0E+01*	1.6E-07
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-15
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.5E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-10
PPDDE	7.4E+01	3.2E+07	7.4E+01	2.9E-04	6.7E-10	2.9E-04	9.0E-09
PPDDT	7.4E+01	6.7E+07	7.4E+01	8.2E-05	9.0E-11	8.2E-05	6.0E-08
DIBROMOCHLOROPROPANE	1.8E+01	5.0E+02	1.7E+01	0.0E+00	1.8E-05	1.8E-05	2.2E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-04
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.8E+00*	3.1E-05a	4.8E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-09
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-08
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-03	4.7E-08a	3.6E-03	0.0E+00
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-05
ISODRIN	5.8E+02	3.8E+07	5.8E+02	1.7E-02	2.6E-07	1.7E-02	5.8E-09
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-09
METHYLENE CHLORIDE	3.3E+03	4.9E+03	2.0E+03	6.1E-03	4.1E-03	1.0E-02	5.3E-05
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-12
TETRACHLOROETHYLENE	5.1E+02	2.1E+04	5.0E+02	0.0E+00	1.5E-05	1.5E-05	9.9E-05
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	8.6E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.8E-05
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.5E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.4E-08
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.7E-05	0.0E+00	5.7E-05	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	5.2E+05	1.5E+00	2.0E+01*	5.7E-05	2.0E+01*	1.6E-07
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-15
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.5E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-10
PPDDE	7.4E+01	3.2E+07	7.4E+01	2.9E-04	6.7E-10	2.9E-04	9.0E-09
PPDDT	7.4E+01	6.7E+07	7.4E+01	8.2E-05	9.0E-11	8.2E-05	6.0E-08
DIBROMOCHLOROPROPANE	1.8E+01	5.0E+02	1.7E+01	0.0E+00	1.8E-05	1.8E-05	2.2E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-04
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.8E+00*	3.1E-05a	4.8E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-09
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.6E-03	4.7E-08a	3.6E-03	0.0E+00
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	1.8E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-05
ISODRIN	5.8E+02	3.8E+07	5.8E+02	1.7E-02	2.6E-07	1.7E-02	5.8E-09
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-09
METHYLENE CHLORIDE	3.3E+03	4.9E+03	2.0E+03	6.1E-03	4.1E-03	1.0E-02	5.3E-05
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-12
TETRACHLOROETHYLENE	5.1E+02	2.1E+04	5.0E+02	0.0E+00	1.5E-05	1.5E-05	9.9E-05
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	8.6E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.8E-05
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.5E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.4E-08
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.7E-05	0.0E+00	5.7E-05	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4a-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	3.5E+04	2.1E-01	1.4E+02*	8.7E-04	1.4E+02*	2.3E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-14
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-03
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-08
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-05
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-06
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	3.0E-07
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-07
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-09
PPDDE	1.0E+01	2.1E+06	1.0E+01	2.1E-03	1.0E-08	2.1E-03	1.4E-07
PPDDT	1.0E+01	4.4E+06	1.0E+01	5.9E-04	1.4E-09	5.9E-04	9.0E-07
DIBROMOCHLOROPROPANE	2.5E+00	3.3E+01	2.3E+00	0.0E+00	2.7E-04	2.7E-04	3.3E-04
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	5.5E-09
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-03
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-03
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	3.4E+01*	4.7E-04a	3.4E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-08
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	8.3E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	8.5E-03	3.0E-07a	8.5E-03	0.0E+00
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-08
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-04
ISODRIN	2.5E+02	5.8E+06	2.5E+02	4.1E-02	1.7E-06	4.1E-02	3.7E-08
METHYLISSOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-08
METHYLENE CHLORIDE	4.5E+02	7.5E+02	2.8E+02	4.4E-02	2.7E-02	7.1E-02	7.9E-04
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	7.1E-12
TETRACHLOROETHYLENE	7.1E+01	3.2E+03	6.9E+01	0.0E+00	9.4E-05	9.4E-05	1.5E-03
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	5.5E-08
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-04
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	1.6E-08
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	9.2E-08
MERCURY	2.0E+03	0.0E+00	2.0E+03	9.6E-05	0.0E+00	9.6E-05	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	9.5E-05	0.0E+00	9.5E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4a-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	1.6E+01*	2.4E-01*	1.6E+01*	8.0E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	8.6E-11
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	5.4E-01
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	2.7E-02
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	8.9E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	5.0E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.3E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	8.5E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-06
PPDDE	9.3E+01	7.6E+03	9.2E+01	2.3E-04	2.8E-06	2.3E-04	4.6E-05
PPDDT	9.3E+01	1.6E+04	9.2E+01	6.4E-05	3.7E-07	6.5E-05	3.1E-04
DIBROMOCHLOROPROPANE	2.3E+01	1.2E-01	1.2E-01	0.0E+00	7.5E-02	7.5E-02	1.1E-01
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-06
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.4E-01
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.4E+01
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	3.8E+00*	1.3E-01*	3.9E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	7.1E-05
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-04
DIMETHYMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	6.5E-03	5.8E-04a	7.1E-03	0.0E+00
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-05
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	2.7E-01
ISODRIN	3.2E+02	3.0E+03	2.9E+02	3.1E-02	3.3E-03	3.4E-02	8.9E-05
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	7.1E-05
METHYLENE CHLORIDE	4.1E+03	4.7E-01	4.7E-01	4.9E-03	4.3E+01*	4.3E+01*	2.7E-01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-08
TETRACHLOROETHYLENE	6.5E+02	2.0E+00	2.0E+00	0.0E+00	1.5E-01*	1.5E-01*	5.1E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	9.4E-02
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	3.9E-05
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	2.2E-04
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.4E-04	0.0E+00	1.4E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	7.0E+04	4.2E+01	1.2E-01	2.6E+02*	7.1E-01*	2.6E+02*	1.2E-06	2.4E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	4.2E-14	8.6E-11
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	7.8E-04	1.6E+00
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-08	3.4E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-05	2.7E-02
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-06	2.7E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-07	5.0E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-02	4.0E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-07	8.5E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-09	1.0E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-09	4.9E-06
PPDDE	5.7E+00	4.2E+06	2.5E+03	5.7E+00	3.7E-03	8.3E-06	3.7E-03	6.8E-08	1.4E-04
PPDDT	5.7E+00	8.9E+06	5.4E+03	5.7E+00	1.0E-03	1.1E-06	1.0E-03	4.5E-07	9.2E-04
DIBROMOCHLOROPROPANE	1.4E+00	6.6E+01	4.0E-02	3.9E-02	0.0E+00	2.2E-01*	2.2E-01*	1.6E-04	3.4E-01
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-09	5.7E-06
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	7.9E-04	1.6E+00
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	6.9E-03	1.4E+01
DIELDRIN	1.2E-01	3.2E+04	1.9E+01	1.2E-01	6.1E+01*	3.9E-01*	6.2E+01*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-08	7.1E-05
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	9.6E-08	2.0E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	3.5E-02	5.8E-04a	3.6E-02	0.0E+00	0.0E+00
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-08	2.8E-05
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-04	2.7E-01
ISODRIN	5.9E+01	5.0E+06	3.0E+03	5.8E+01	1.7E-01*	3.3E-03	1.7E-01*	4.3E-08	8.9E-05
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-08	7.1E-05
METHYLENE CHLORIDE	2.5E+02	6.5E+02	4.7E-01	4.7E-01	8.1E-02	4.3E+01*	4.3E+01*	3.9E-04	8.1E-01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	8.2E-12	1.7E-08
TETRACHLOROETHYLENE	4.1E+01	2.7E+03	2.0E+00	1.9E+00	0.0E+00	1.5E-01*	1.5E-01*	7.4E-04	1.5E+00
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	6.4E-08	1.3E-04
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-04	2.8E-01
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.9E-08	3.9E-05
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-07	2.2E-04
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	4.1E-04	0.0E+00	4.1E-04	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	7.2E-04	0.0E+00	7.2E-04	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.14 SITE NCSA-4b: BASIN F EXTERIOR (formerly Site 26-6: Basin F Exterior; ESE, 1988o/RIC 88173R02A)

2.14.1 Site-Specific Considerations

Figure NCSA-4b-1 and Tables NCSA-4b-1 and NCSA-4b-2 depict the target contaminants for site NCSA-4b. Borings 4712 through 4752 were included in this exposure assessment, consistent with the North Central SAR. This site includes only the perimeter and wind rose data collected during the Phase II investigation for Basin F. There was no site history associated with this area in the SAR (ESE, 1988o/RIC 88173R02A).

2.14.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-4b are shown in Figure NCSA-4b-1. Methylphosphonic acid, occurring in Boring 4738 (29-30 ft) was not included in this figure, since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown on this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-4b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Methylphosphonic acid was not detected in the 0-10 ft interval. Table NCSA-4b-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.14.3 Site Exposure Summary

Tables NCSA-4b-3 through NCSA-4b-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-4b is greater than 10 ft,

the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

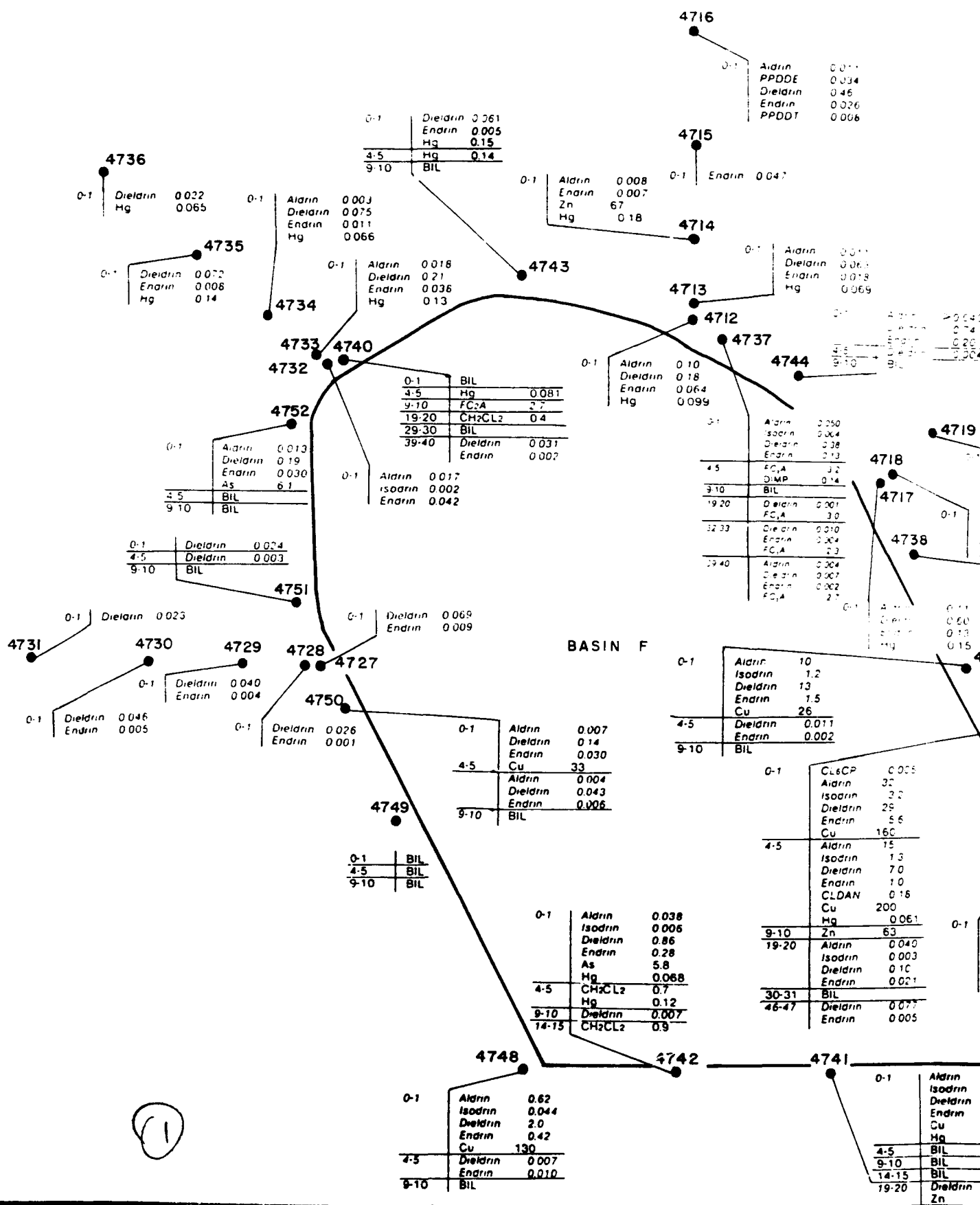
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
PPDDT	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Chlordane	--	--	Direct	--	Direct
Fluoroacetic acid	--	--	Direct	Direct	Direct
Methylene chloride	--	--	--	Indirect	Indirect
Endrin	--	--	--	--	Direct
Isodrin	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-4b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- 1,2-Dichloroethane (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Dicyclopentadiene (enclosed)
- Chloroform (enclosed)



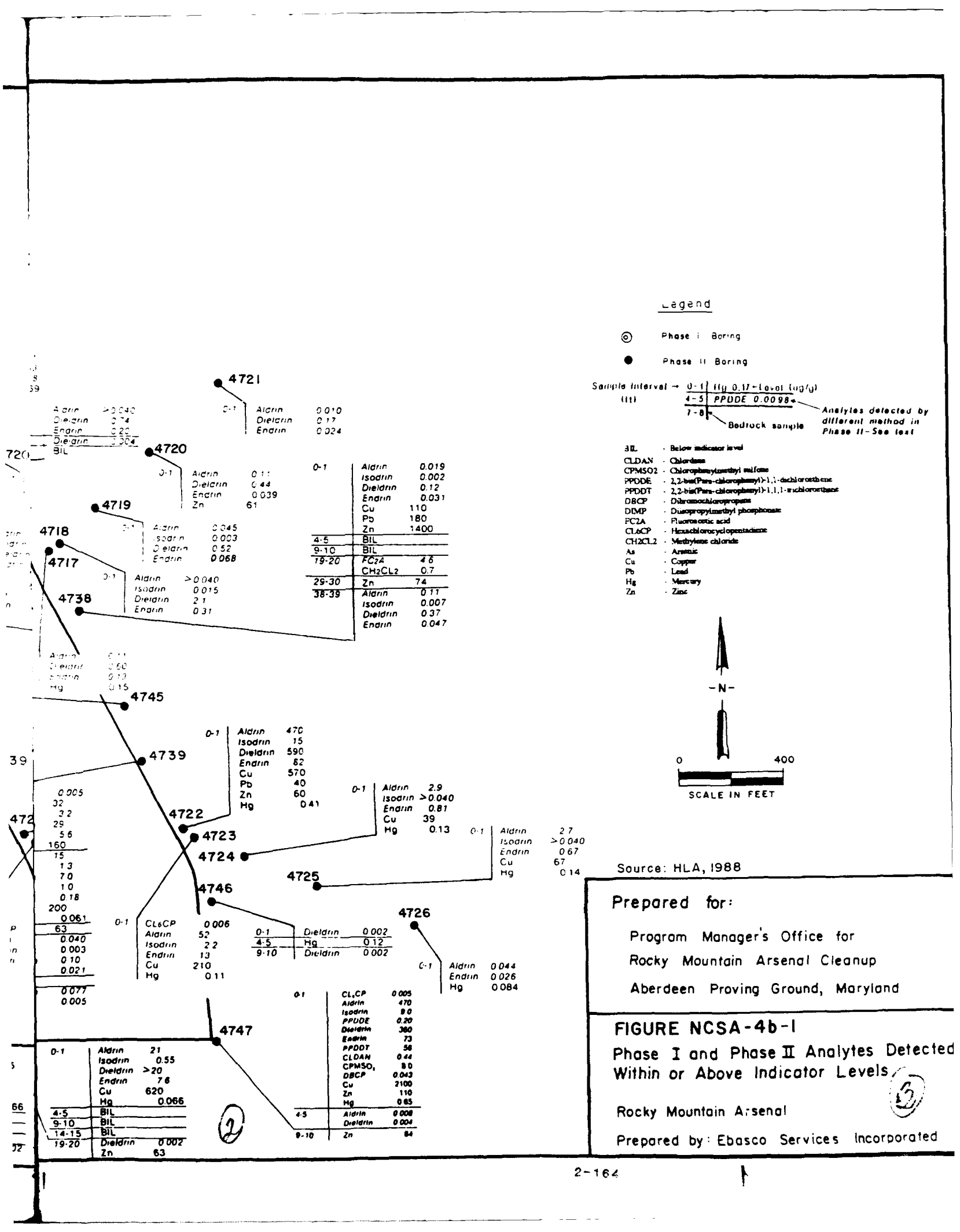


TABLE NCSA-4b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-4b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	470	0-1	4722	470	0-1	4722
Chlordane		0-1	4747		0-1	4747
Chlorophenylmethyl sulfone	0.44	0-1	4747	0.44	0-1	4747
PPDDE ^{1/}	8.0	0-1	4747	8.0	0-1	4747
PPDDT ^{2/}	0.20	0-1	4747	0.20	0-1	4747
	56	0-1	4747	56	0-1	4747
Dibromochloropropane	0.043	0-1	4747	0.043	0-1	4747
Diisopropylmethyl phosphonate	0.14	4-5	4737	0.14	4-5	4737
Dieldrin	590	0-1	4722	590	0-1	4722
Endrin	82	0-1	4722	82	0-1	4722
Fluoroacetic acid	3.2	4-5	4737	4.6	19-20	4738
Hexachlorocyclopentadiene	0.006	0-1	4723	0.006	0-1	4723
Isodrin	15	0-1	4722	15	0-1	4722
Methylene chloride	0.7	4-5	4742	0.9	14-15	4742
Methyl phosphonic acid ^{3/}	--	--	--	5.2	29-30	4738
Copper	2100	0-1	4747	--	--	--
Lead	180	0-1	4738	--	--	--
Mercury	0.65	0-1	4747	--	--	--
Zinc	1400	0-1	4730	--	--	--

1/ PPDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-4b-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4b

AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	120	23049	01/26/88
1,1,2-TRICHLOROETHANE	4.3	26148	11/22/88
1,1-DICHLOROETHYLENE	230	26157	07/27/88
1,1-DICHLOROETHANE	4.4	26148	08/16/88
1,2-DICHLOROETHYLENE	13	26148	02/9/89
1,2-DICHLOROETHANE	930	26157	02/13/89
M-XYLENE	2.2	26017	07/26/88
ALDRIN	10	26157	11/21/88
ATRAZINE	GT 1000	23237	02/8/89
BICYCLOHEPTADIENE	540	26148	08/16/88
BENZOTHIAZOLE	GT 50	26020	01/15/88
BENZENE	220	26148	02/9/89
METHYLENE CHLORIDE	430	23179	01/25/88
CHLOROFORM	56000	26157	11/21/88
HEXACHLOROCYCLOPENTADIENE	12	26148	08/16/88
CHLOROBENZENE	70	23049	01/26/88
CHLORDANE	120	26148	02/9/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-4b-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4b

AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROPHENYLMETHYL SULFIDE	420	26148	08/16/88
CHLOROPHENYLMETHYL SULFOXIDE	390	26148	11/22/88
CHLOROPHENYLMETHYL SULFONE	860	26157	07/27/88
DIBROMOCHLOROPROPANE	28	26157	11/21/88
DICYCLOPENTADIENE	3600	23049	11/11/88
VAPONA	2.4	23049	11/11/88
DIISOPROPYLMETHYL PHOSPHONATE	2600	23239	11/18/88
DITHIANE	570	26148	08/16/88
DIELDRIN	7.6	23241	11/18/88
DIMETHYL DISULFIDE	4.0	23049	05/31/88
DIMETHYLMETHYL PHOSPHONATE	140	23049	02/10/89
ENDRIN	4.8	23239	11/18/88
ETHYLBENZENE	6.1	23049	09/1/87
ISODRIN	4.9	26011	01/13/88
TOLUENE	79	26148	02/9/89
METHYLISOBUTYL KETONE	140	26148	08/16/88
MALATHION	4.2	23049	02/10/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-4b-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-4b
AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,4-oxathiane	78	23049	11/11/88
PPDDE	2.1	23049	07/26/88
PPDDT	4.4	23049	09/1/87
PARATHION	15	26157	11/21/88
SUPONA	11	23049	02/10/89
TETRACHLOROETHYLENE	350	26157	11/21/88
TRICHLOROETHYLENE	230	26157	11/21/88
O,P-XYLENE	22	26148	02/9/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-4b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	3.1E+02*	1.5E-05a	3.1E+02*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	8.0E-07
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	7.7E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
CHLORDANE	2.0E+01	3.3E+09	2.0E+01	2.3E-02	1.3E-10	2.3E-02	1.6E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.3E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	4.9E+08	1.6E+05	4.9E-05	1.6E-08	4.9E-05	1.3E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-11
PPDE	7.4E+01	1.9E+09	7.4E+01	2.7E-03	1.1E-10	2.7E-03	5.8E-10
PPDT	7.4E+01	1.0E+06	7.4E+01	7.6E-01*	1.4E-08a	7.6E-01*	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	4.6E+04	1.8E+01	2.4E-03	9.3E-07	2.4E-03	2.1E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	4.4E-12
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-06
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-05
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.7E+02*	4.2E-05a	3.7E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.3E+09	6.6E+05	2.1E-07	1.1E-10	2.1E-07	2.2E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-10
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.3E-02	7.2E-09a	3.3E-02	0.0E+00
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	8.2E-02	0.0E+00	8.2E-02	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	5.6E+05	1.6E+04	3.6E-07	1.1E-08	3.7E-07	3.7E-07
ISODRIN	5.8E+02	2.2E+09	5.8E+02	2.6E-02	6.8E-09	2.6E-02	5.9E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	7.0E-16
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-11
METHYLENE CHLORIDE	3.3E+03	5.2E+05	3.3E+03	2.1E-04	1.7E-06	2.2E-04	3.1E-07
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.4E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-10
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	6.2E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	7.3E-07
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.2E-12
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.7E-12
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.6E-11

NCSA-4b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
COPPER	4.2E+05	0.0E+00	4.2E+05	5.0E-03	0.0E+00	5.0E-03	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	1.2E-02	0.0E+00	1.2E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.0E-04	0.0E+00	2.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	7.1E-04	0.0E+00	7.1E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4b-4

EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.0E+06	1.5E+00	3.1E+02*	1.5E-05a	3.1E+02*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	8.0E-07
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	7.7E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
CHLORDANE	2.0E+01	3.3E+09	2.0E+01	2.3E-02	1.3E-10	2.3E-02	1.6E-08
CHLORO BENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.3E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	4.9E+08	1.6E+05	4.9E-05	1.6E-08	4.9E-05	1.3E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-11
PPDDE	7.4E+01	1.9E+09	7.4E+01	2.7E-03	1.1E-10	2.7E-03	5.8E-10
PPDDT	7.4E+01	1.0E+06	7.4E+01	7.6E-01*	1.4E-08a	7.6E-01*	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	4.6E+04	1.8E+01	2.4E-03	9.3E-07	2.4E-03	2.1E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	4.4E-12
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-06
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-04
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-05
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.7E+02*	4.2E-05a	3.7E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.3E+09	6.6E+05	2.1E-07	1.1E-10	2.1E-07	2.2E-10
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-10
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	3.3E-02	7.2E-09a	3.3E-02	0.0E+00
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	8.2E-02	0.0E+00	8.2E-02	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	5.6E+05	1.6E+04	3.6E-07	1.1E-08	3.7E-07	3.7E-07
ISODRIN	5.8E+02	2.2E+09	5.8E+02	2.6E-02	6.8E-09	2.6E-02	5.9E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	7.0E-16
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-11
METHYLENE CHLORIDE	3.3E+03	5.2E+05	3.3E+03	2.1E-04	1.7E-06	2.2E-04	3.1E-07
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.4E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-10
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	6.2E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	7.3E-07
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	3.2E-12
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.7E-12
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.6E-11

NCSA-4b-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
COPPER	4.2E+05	0.0E+00	4.2E+05	5.0E-03	0.0E+00	5.0E-03	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	1.2E-02	0.0E+00	1.2E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	2.0E-04	0.0E+00	2.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	7.1E-04	0.0E+00	7.1E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4b-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.0E+06	2.1E-01	2.3E+03*	2.3E-04a	2.3E+03*	0.0E+00
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	8.0E-14
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-05
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.0E-10
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-07
CHLORDANE	2.7E+00	2.2E+08	2.7E+00	1.6E-01*	2.0E-09	1.6E-01*	2.5E-07
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	4.6E-04
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-09
CHLOROPHENYLMETHYL SULFONE	7.0E+04	2.0E+08	7.0E+04	1.1E-04	4.0E-08	1.1E-04	8.4E-11
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-11
PPDDE	1.0E+01	1.2E+08	1.0E+01	2.0E-02	1.6E-09	2.0E-02	8.8E-09
PPDDT	1.0E+01	1.0E+06	1.0E+01	5.5E+00*	2.2E-07a	5.5E+00*	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	7.2E+03	2.5E+00	1.7E-02	6.0E-06	1.7E-02	3.2E-06
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	6.6E-11
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-05
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-03
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-04
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	2.7E+03*	6.4E-04a	2.7E+03*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	4.5E+08	2.8E+05	5.0E-07	3.1E-10	5.0E-07	1.4E-09
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	8.7E-10
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	7.8E-02	4.7E-08a	7.8E-02	0.0E+00
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-10
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	1.9E-01*	0.0E+00	1.9E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	2.0E+05	5.5E+03	1.1E-06	3.0E-08	1.1E-06	2.4E-06
ISODRIN	2.5E+02	3.4E+08	2.5E+02	6.1E-02	4.4E-08	6.1E-02	3.8E-09
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-15
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-10
METHYLENE CHLORIDE	4.5E+02	8.0E+04	4.5E+02	1.5E-03	1.1E-05	1.6E-03	4.7E-06
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	3.9E-13
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	8.9E-15
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	8.6E-06
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	2.8E-10
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-09
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	9.3E-08
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-05
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	4.8E-11
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	5.0E-11
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	4.9E-10

NCSA-4b-5

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
COPPER	2.5E+05	0.0E+00	2.5E+05	8.5E-03	0.0E+00	8.5E-03	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.9E-02	0.0E+00	1.9E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	3.3E-04	0.0E+00	3.3E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.3E-03	0.0E+00	1.3E-03	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	2.5E+02*	3.7E+00*	2.5E+02*	0.0E+00
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-08
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.5E-01
BENZOTHAZOLE -	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	7.1E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-02
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	1.8E-02	3.2E-05	1.8E-02	5.0E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-03
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	9.3E+00
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	1.9E+04	1.6E+04	8.8E-05	4.2E-04	5.1E-04	1.2E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-05
PPDDE	9.3E+01	1.9E+01	1.6E+01	2.1E-03	1.0E-02	1.2E-02	1.8E-04
PPDDT	9.3E+01	1.9E+01	1.6E+01	6.0E-01*	2.9E+00*	3.5E+00*	0.0E+00
DIBROMOCHLOROPROPANE	2.3E+01	4.8E+00	3.9E+00	1.9E-03	9.0E-03	1.1E-02	6.5E-02
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-06
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-01
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	5.8E+01
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.7E+01
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	3.0E+02*	1.0E+01*	3.1E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	8.5E+03	8.3E+03	3.8E-07	1.6E-05	1.7E-05	2.0E-04
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	6.0E-02	5.3E-03a	6.5E-02	0.0E+00
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-05
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	1.5E-01*	0.0E+00	1.5E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.9E+01	1.9E+01	1.1E-06	3.1E-04	3.1E-04	3.4E-01
ISODRIN	3.2E+02	3.0E+03	2.9E+02	4.7E-02	4.9E-03	5.2E-02	5.4E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	6.4E-10
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	3.1E-05
METHYLENE CHLORIDE	4.1E+03	8.7E-01	8.7E-01	1.7E-04	1.0E+00*	1.0E+00*	9.6E-02
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	4.0E-05
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-04
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-03
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-01
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	9.8E-07
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	7.1E-06
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	7.0E-05

NCSA-4b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
COPPER	1.8E+05	0.0E+00	1.8E+05	1.2E-02	0.0E+00	1.2E-02	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	2.8E-02	0.0E+00	2.8E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	4.7E-04	0.0E+00	4.7E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.8E-03	0.0E+00	1.8E-03	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-4b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	4.1E+06	4.2E+01	1.2E-01	4.0E+03*	1.1E+01*	4.0E+03*	0.0E+00	0.0E+00
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	9.2E-14	1.1E-08
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	6.0E-06	7.4E-01
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	5.8E-10	7.1E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-07	1.4E-02
CHLORDANE	1.5E+00	4.4E+08	4.5E+03	1.5E+00	2.9E-01*	9.7E-05	2.9E-01*	1.2E-07	1.5E-02
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-08	2.0E-03
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-04	2.8E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-09	4.9E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	6.6E+07	5.7E+04	1.3E+04	4.8E-04	1.4E-04	6.2E-04	9.7E-11	1.2E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	8.5E-11	1.0E-05
PPDDE	5.7E+00	2.5E+08	1.9E+01	4.4E+00	3.5E-02	1.0E-02	4.5E-02	4.4E-09	5.4E-04
PPDDT	5.7E+00	5.2E+08	1.9E+01	4.4E+00	9.8E+00*	2.9E+00*	1.3E+01*	0.0E+00	0.0E+00
DIBROMOCHLOROPROPANE	1.4E+00	6.2E+03	4.8E+00	1.1E+00	3.1E-02	9.0E-03	4.0E-02	1.6E-06	1.9E-01
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	3.3E-11	4.0E-06
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-05	1.7E+00
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-03	1.7E+02
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-04	3.7E+01
DIELDRIN	1.2E-01	1.9E+06	1.9E+01	1.2E-01	4.8E+03*	3.1E+01*	4.9E+03*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	1.7E+08	2.6E+04	1.9E+04	2.1E-06	5.5E-06	7.5E-06	1.6E-09	2.0E-04
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-09	1.2E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	3.2E-01*	5.3E-03a	3.3E-01*	0.0E+00	0.0E+00
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-10	1.4E-05
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	8.1E-01*	0.0E+00	8.1E-01*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	7.5E+04	5.8E+01	5.0E+01	1.6E-05	1.0E-04	1.2E-04	2.8E-06	3.4E-01
ISODRIN	5.9E+01	3.0E+08	3.0E+03	5.8E+01	2.5E-01*	4.9E-03	2.6E-01*	4.4E-09	5.4E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-15	6.4E-10
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-10	3.1E-05
METHYLENE CHLORIDE	2.5E+02	6.9E+04	8.7E-01	8.6E-01	2.8E-03	1.0E+00*	1.0E+00*	2.3E-06	2.9E-01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	4.5E-13	5.5E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-14	1.3E-09
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	4.3E-06	5.2E-01
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-10	4.0E-05
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-09	2.4E-04
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-08	5.7E-03
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-06	6.7E-01
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-11	2.9E-06
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	5.8E-11	7.1E-06
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-10	7.0E-05

NCSA-4b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	3.7E-02	0.0E+00	3.7E-02	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	8.2E-02	0.0E+00	8.2E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	1.4E-03	0.0E+00	1.4E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.0E-02	0.0E+00	1.0E-02	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux.
The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.15 SITE NCSA-5a: BASIN B (formerly Site 35-3: Basin B; ESE, 1987k/RIC 87203R05 and ESE, 1988r/RIC 87203R05A)

2.15.1 Site-Specific Considerations

Figure NCSA-5a-1 and Tables NCSA-5a-1 and NCSA-5a-2 depict the target contaminants for site NCSA-5a. Borings 4046 through 4051, 4112, 4113, 4114/4138, and 4115 through 4122, and 4138 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-5a (ESE, 1987k/RIC 87203R05).

2.15.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-5a are shown in Figure NCSA-5a-1. Methylphosphonic acid occurring in Boring 4114/4138 (4-5 ft) was not included in the figure since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown in this figure, methylphosphonic acid was included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-5a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Methylene chloride, shown in Table NCSA-5a-1 is excluded from consideration in the exposure analysis for this site because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-5a-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.15.3 Site Exposure Summary

Tables NCSA-5a-3 through NCSA-5a-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-5a is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Direct	Direct
Chlordane	Direct	Direct	Direct	Direct	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
Cadmium	--	--	--	-	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-5a is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

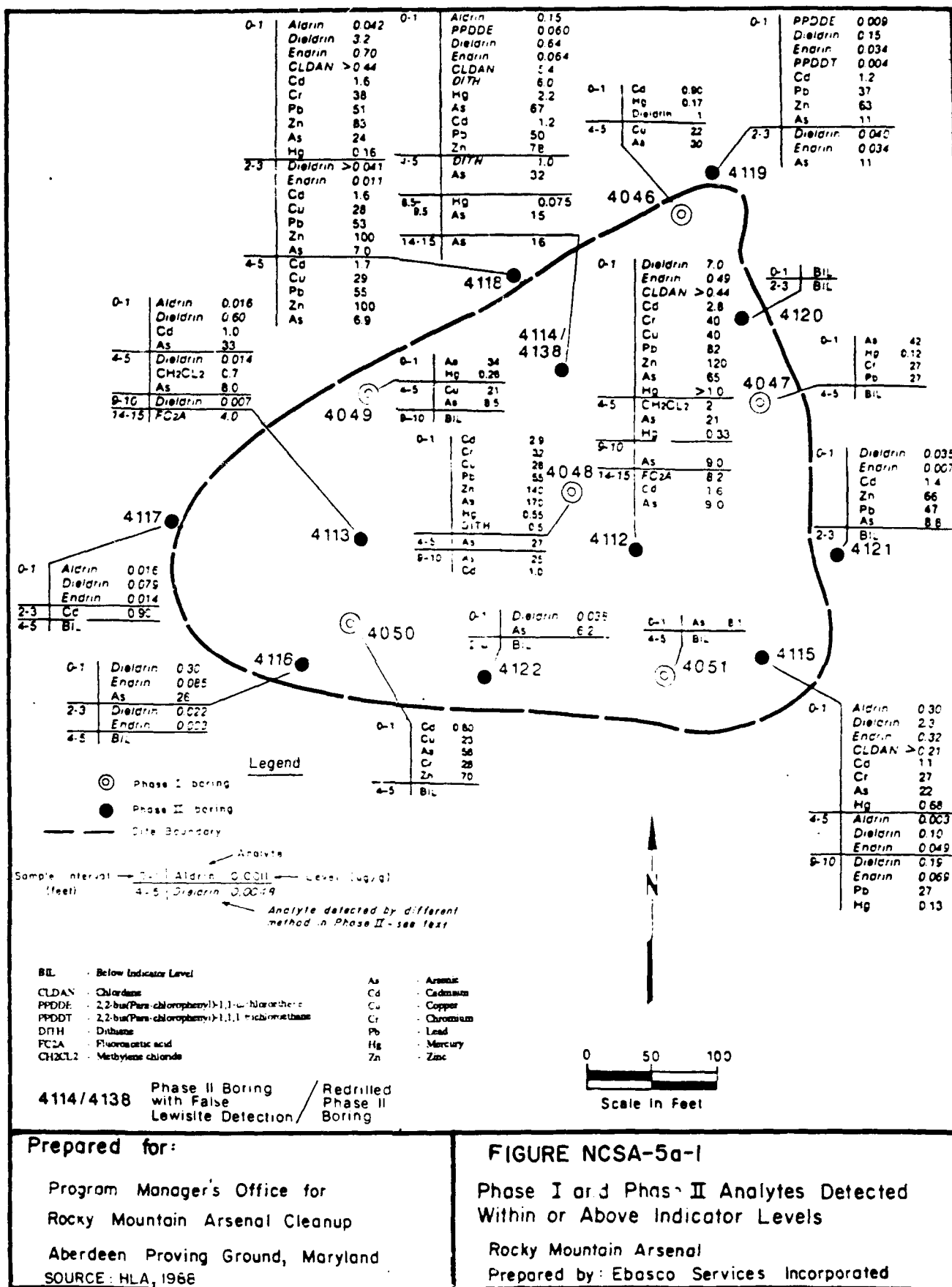


TABLE NCSA-5a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-5a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	0.30	0-1	4115	0.30	0-1	4115
Chlordane	5.4	0-1	4114/4138	5.4	0-1	4114/4138
PPDDE ^{1/}	0.060	0-1	4114/4138	0.060	0-1	4114/4138
PPDDT ^{2/}	0.0040	0-1	4119	0.0040	0-1	4119
Dieldrin	7.0	0-1	4112	7.0	0-1	4112
Dithiane	6.0	0-1	4114/4138	6.0	0-1	4114/4138
Endrin	0.70	0-1	4118	0.70	0-1	4118
Fluoroacetic acid	--	--	--	8.2	14-15	4112
Methylene chloride ^{3/}	2	4-5	4112	2	4-5	4112
Methyl phosphonic acid ^{4/}	110	4-5	4114/4138	110	4-5	4114/4138
Arsenic	170	0-1	4048	--	--	--
Cadmium	2.9	0-1	4048	--	--	--
Copper	40	0-1	4112	--	--	--
Lead	82	0-1	4112	--	--	--
Mercury	2.2	0-1	4114/4138	--	--	--
Zinc	140	0-1	4048	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Suspected laboratory contaminant.

4/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-5a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5a
AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ATRAZINE	53	35079	12/1/88
BENZENE	2.4	35079	06/9/88
CHLOROFORM	2.3	35079	12/1/88
HEXACHLOROCYCLOPENTADIENE	0.10	35079	12/1/88
CHLOROPHENYLMETHYL SULFIDE	6.8	35079	06/9/88
CHLOROPHENYLMETHYL SULFONE	8.1	35079	11/30/88
DIISOPROPYLMETHYL PHOSPHONATE	2000	35079	12/1/88
DITHIANE	840	35079	12/1/88
DIELDRIN	0.38	35079	12/1/88
ENDRIN	0.41	35079	12/1/88
ISODRIN	0.90	35079	12/1/88
MALATHION	7.2	35079	12/1/88
1,4-OXATHIANE	73	35079	12/1/88
PPDDE	0.34	35079	12/1/88
PPDDT	0.39	35079	12/1/88
SUPONA	1.2	35079	12/1/88
TETRACHLOROETHYLENE	1.1	35079	12/1/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-5a-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5a

AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
TRICHLOROETHYLENE	4.3	35079	12/1/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-5a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.5E+05	1.5E+00	2.0E-01*	2.0E-06	2.0E-01*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-06
CHLORDANE	2.0E+01	1.6E+07	2.0E+01	2.8E-01*	3.3E-07	2.8E-01*	0.0E+00
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-07
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-11
PPDDE	7.4E+01	9.1E+06	7.4E+01	8.2E-04	6.6E-09	8.2E-04	2.7E-08
PPDDT	7.4E+01	1.9E+07	7.4E+01	5.4E-05	2.1E-10	5.4E-05	2.2E-07
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.4E+00*	1.0E-04 ^a	4.4E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-08
DITHIANE	8.3E+04	0.0E+00	8.3E+04	7.3E-05	0.0E+00	7.3E-05	0.0E+00
ENDRIN	2.5E+03	5.6E+07	2.5E+03	2.8E-04	1.3E-08	2.8E-04	2.3E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	9.0E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-13
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	4.3E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-07
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-06
ARSENIC	2.2E+01	0.0E+00	2.2E+01	7.9E+00*	0.0E+00	7.9E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.4E-03	0.0E+00	6.4E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	9.6E-05	0.0E+00	9.6E-05	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.3E-03	0.0E+00	5.3E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	6.7E-04	0.0E+00	6.7E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	7.1E-05	0.0E+00	7.1E-05	0.0E+00

^a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

MCSA-5a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.5E+05	1.5E+00	2.0E-01*	2.0E-06	2.0E-01*	0.0E+00
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-06
CHLORDANE	2.0E+01	1.6E+07	2.0E+01	2.8E-01*	3.3E-07	2.8E-01*	0.0E+00
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-07
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-11
PPDE	7.4E+01	9.1E+06	7.4E+01	8.2E-04	6.6E-09	8.2E-04	2.7E-08
PPDT	7.4E+01	1.9E+07	7.4E+01	5.4E-05	2.1E-10	5.4E-05	2.2E-07
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	4.4E+00*	1.0E-04a	4.4E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-08
DITHIANE	8.3E+04	0.0E+00	8.3E+04	7.3E-05	0.0E+00	7.3E-05	0.0E+00
ENDRIN	2.5E+03	5.6E+07	2.5E+03	2.8E-04	1.3E-08	2.8E-04	2.3E-11
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	9.0E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	3.4E-13
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	4.3E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-07
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-06
ARSENIC	2.2E+01	0.0E+00	2.2E+01	7.9E+00*	0.0E+00	7.9E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.4E-03	0.0E+00	6.4E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	9.6E-05	0.0E+00	9.6E-05	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.3E-03	0.0E+00	5.3E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	6.7E-04	0.0E+00	6.7E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	7.1E-05	0.0E+00	7.1E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5a-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	1.0E+04	2.1E-01	1.4E+00*	3.0E-05	1.4E+00*	0.0E+00
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-12
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-05
CHLORDANE	2.7E+00	1.1E+06	2.7E+00	2.0E+00*	5.0E-06	2.0E+00*	0.0E+00
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	5.4E-06
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-08
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-10
PPDDE	1.0E+01	6.0E+05	1.0E+01	5.9E-03	1.0E-07	5.9E-03	4.1E-07
PPDDT	1.0E+01	1.3E+06	1.0E+01	3.9E-04	3.1E-09	3.9E-04	3.3E-06
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	3.2E+01*	1.5E-03a	3.2E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.1E-07
DITHIANE	3.5E+04	0.0E+00	3.5E+04	1.7E-04	0.0E+00	1.7E-04	0.0E+00
ENDRIN	1.1E+03	8.6E+06	1.1E+03	6.6E-04	8.1E-08	6.6E-04	1.5E-10
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	5.8E-06
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-07
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-12
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-13
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	8.0E-06
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	5.9E-05
ARSENIC	3.9E+00	0.0E+00	3.9E+00	4.3E+01*	0.0E+00	4.3E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	5.0E-02	0.0E+00	5.0E-02	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	1.6E-04	0.0E+00	1.6E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	8.9E-03	0.0E+00	8.9E-03	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	1.1E-03	0.0E+00	1.1E-03	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.3E-04	0.0E+00	1.3E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5a-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	1.6E-01*	2.4E-03	1.6E-01*	0.0E+00
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-10
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	4.1E-03
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	2.2E-01*	4.0E-04	2.2E-01*	0.0E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	6.0E-04
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-05
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-07
PPDDE	9.3E+01	1.9E+01	1.6E+01	6.4E-04	3.1E-03	3.7E-03	4.6E-05
PPDDT	9.3E+01	1.9E+01	1.6E+01	4.3E-05	2.1E-04	2.5E-04	3.7E-04
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	3.5E+00*	1.2E-01*	3.6E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	2.4E-04
DITHIANE	4.6E+04	0.0E+00	4.6E+04	1.3E-04	0.0E+00	1.3E-04	0.0E+00
ENDRIN	1.4E+03	1.6E+04	1.3E+03	5.1E-04	4.5E-05	5.5E-04	1.2E-07
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.5E-03
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-09
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	8.9E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	6.5E-03
ARSENIC	2.0E+01	0.0E+00	2.0E+01	8.5E+00*	0.0E+00	8.5E+00*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	8.1E-03	0.0E+00	8.1E-03	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	2.3E-04	0.0E+00	2.3E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.3E-02	0.0E+00	1.3E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.6E-03	0.0E+00	1.6E-03	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.8E-04	0.0E+00	1.8E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-5a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	2.0E+04	4.2E+01	1.2E-01	2.6E+00*	7.2E-03	2.6E+00*	0.0E+00	0.0E+00
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-12	9.3E-10
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-05	1.2E-02
CHLORDANE	1.5E+00	2.2E+06	5.2E+00	1.2E+00	3.6E+00*	1.0E+00*	4.6E+00*	0.0E+00	0.0E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-06	1.8E-03
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-08	1.2E-05
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-10	1.7E-07
PPDDE	5.7E+00	1.2E+06	1.9E+01	4.4E+00	1.0E-02	3.1E-03	1.4E-02	2.0E-07	1.4E-04
PPDDT	5.7E+00	2.6E+06	1.9E+01	4.4E+00	7.0E-04	2.1E-04	9.0E-04	1.7E-06	1.1E-03
DIELDRIN	1.2E-01	9.1E+03	1.9E+01	1.2E-01	5.7E+01*	3.7E-01*	5.8E+01*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-07	2.4E-04
DI	8.5E+03	0.0E+00	0.0E+00	8.5E+03	7.1E-04	0.0E+00	7.1E-04	0.0E+00	0.0E+00
END	2.5E+02	7.4E+06	1.6E+04	2.5E+02	2.8E-03	4.5E-05	2.8E-03	1.8E-10	1.2E-07
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	6.7E-06	4.5E-03
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-07	1.6E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-12	1.7E-09
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	3.2E-13	2.1E-10
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	4.0E-06	2.7E-03
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-05	2.0E-02
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.1E+02*	0.0E+00	1.1E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	3.8E-01*	0.0E+00	3.8E-01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	7.0E-04	0.0E+00	7.0E-04	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	3.7E-02	0.0E+00	3.7E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	4.8E-03	0.0E+00	4.8E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.0E-03	0.0E+00	1.0E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.16 SITE NCSA-5b: DRAINAGE DITCHES (formerly Site 35-4/26-7: Basins A, B, and C Drainage Ditches; ESE 1987/1/RIC 87203R06 and ESE, 1988s/RIC 87203R06A)

2.16.1 Site-Specific Considerations

Figure NCSA-5b-1 and Tables NCSA-5b-1 and NCSA-5b-2 depict the target contaminants for site NCSA-5b. Borings 4052 through 4056, 4086 through 4088, 4100 through 4111, and 4631 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-5b (ESE, 1987/1/RIC 87203R06).

2.16.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-5b are shown in Figure NCSA-5b-1. The following contaminants were not included in this figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Oxybisethanol, occurring in Boring 4052 (4-5 ft), and 1,1,2,2-tetrachloroethane, occurring in Boring 4053 (19-20 ft). Although not shown on this figure, oxybisethanol and 1,1,2,2-tetrachloroethane were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-5b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-5b-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.16.3 Site Exposure Summary

Tables NCSA-5b-3 through NCSA-5b-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-5b is greater than 10 ft,

the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Chlordane	Direct	Direct	Direct	Direct	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
Fluoroacetic acid	--	--	Direct	Direct	Direct
Methylene chloride	--	--	--	Indirect	Indirect
1,1,2,2-Tetrachloroethane	--	--	--	Indirect	Indirect
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-5b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value less than 1.

0-1	Cu	25
	Pb	33
	As	15
	Aldrin	4
	Dieldrin	4
4-5	Cu	23
9-10	BIL	
14-15	Cu	24
19-20	Cu	26
	Zn	61

0-1	Aldrin	0.26
	PPDE	0.009
	Dieldrin	0.46
	Endrin	0.021
	As	8.4
	Hg	0.66
2-3	Aldrin	2.0
	PPDE	0.016
	Dieldrin	0.91
	Cd	1.3
	Pb	36
	Zn	82
	As	23
	Hg	0.35
4-5	Cd	1.1
	As	13
	Hg	0.10
9-10	As	6.7

0-1	Dieldrin	1.1
	Cd	1.1
	Pb	72
	As	30
	Hg	1.7
2-3	Dieldrin	0.27
	Cd	1.0
	Pb	47
	Zn	65
	As	13
	Hg	0.28
4-5	Pb	30
	Zn	64
	As	11
	Hg	0.098
9-10	As	7.0

0-1	As	15
	Hg	0.58
	Dieldrin	9.3
4-5	As	22
	Pb	130
	Zn	64
	Hg	0.07

5-6	Dieldrin	0.16
	As	5.6
7-8	Dieldrin	0.17
	Endrin	0.041
	Cd	1.4
	Pb	30
	Zn	62
	As	15
9-10	As	10
14-15	BIL	

0-1	Pb	33
	As	41
	Hg	2.3
	Dieldrin	1
4-5	As	7.7
9-10	As	5.8
14-15	As	11
19-20	As	16
	Zn	62
23-24	As	8.6
	DIMP	0.6

0-1	As	
4-5	Zn	
	As	

Basin C

Basin B

Legend

- Phase I Boring ——— Site Investigated
● Phase II Boring

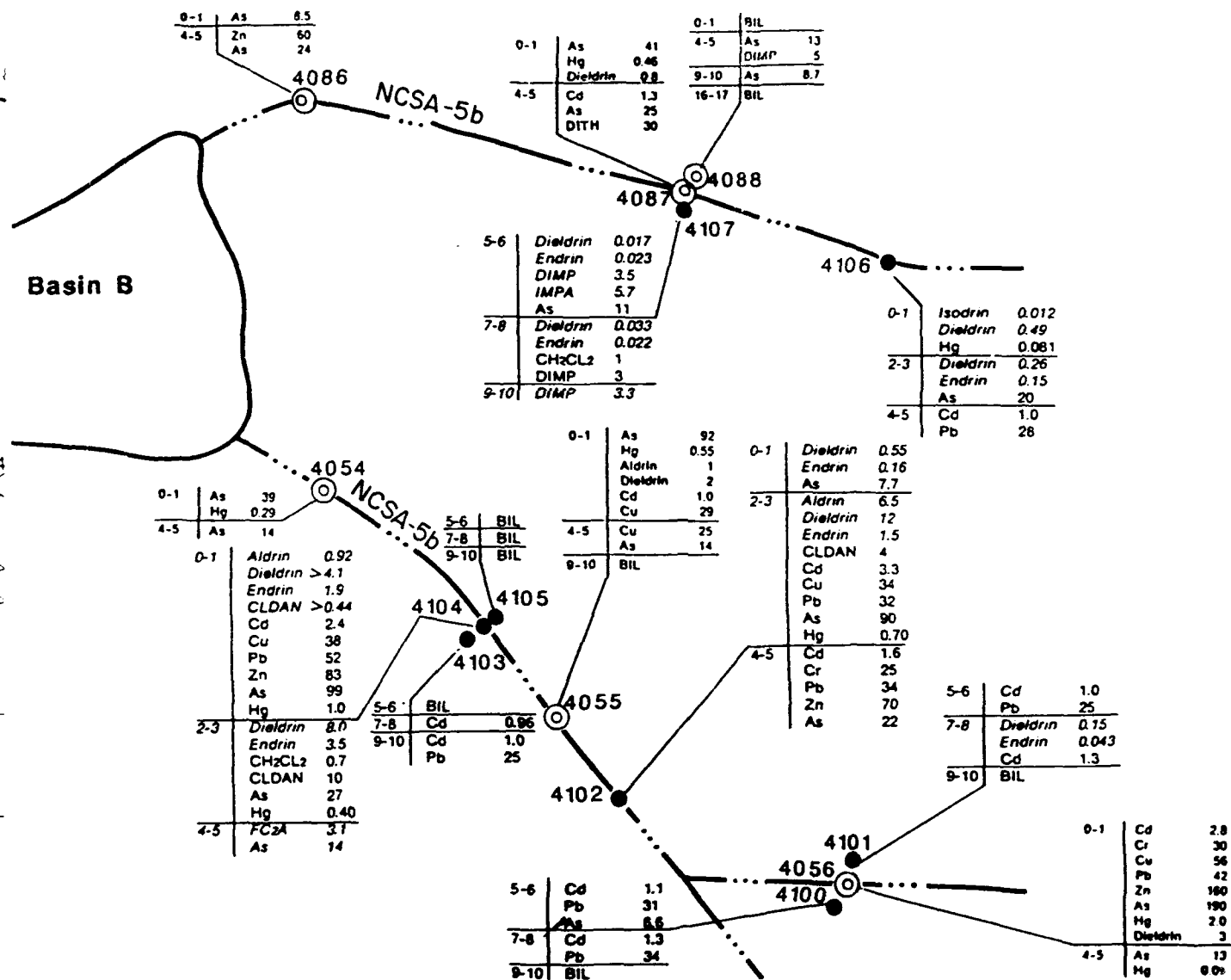
Sample Interval ~ 0-1 11g 0.17-Level (ug/g)
4-5 PPDE 0.0098
7-8 Bedrock sample

Analytes detected by different method in Phase II-See text

- BIL - Below indicator level
CLDAN - Chlordane
PPDE - 2,2-bis(4-chlorophenyl)-1,1-dichloroethane
DIMP - Diisopropyl methyl phosphonate
DITH - Dithionite
PCA - Picramic acid
BSPA - Isopropyl methyl phosphonic acid
CHCL2 - Methylene chloride
As - Arsenic
Cd - Cadmium
Cu - Copper
Cr - Chromium
Pb - Lead
Hg - Mercury
Zn - Zinc

0 100 200
Scale in Feet

0-1	As	0
	Hg	0
4-5	As	
0-1	A	
	C	
	E	
	C	
	C	
	F	
	2	
	A	
	H	
2-3	Z	
	E	
	C	
	C	
	/	
	/	
4-5	/	
	/	



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

Source: HLA 1988

FIGURE NCSA-5b-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated

TABLE NCSA-5b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-5b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	6.5	2-3	4102	6.5	2-3	4102
Chlordane	10	2-3	4104	10	2-3	4104
PPDDE ^{1/}	0.016	2-3	4111	0.016	2-3	4111
Dieldrin	12	2-3	4102	12	2-3	4102
Diisopropylmethyl phosphonate	5	4-5	4088	5	4-5	4088
Dithiane	30	4-5	4087	30	4-5	4087
Endrin	3.5	2-3	4104	3.5	2-3	4104
Fluoroacetic acid	3.1	4-5	4104	3.1	4-5	4104
Isodrin	0.012	0-1	4106	0.012	0-1	4106
Isopropylmethylphosphonic acid	5.7	5-6	4107	5.7	5-6	4107
Methylene chloride	1	7-8	4107	1	7-8	4107
Oxybisethanol ^{2/}	1.0	4-5	4052	1.0	4-5	4052
1,1,2,2-Tetrachloroethane ^{2/}	--	--	--	6.0	19-20	4053
Arsenic	190	0-1	4056	--	--	--
Cadmium	3.3	2-3	4102	--	--	--
Copper	56	0-1	4056	--	--	--
Lead	130	4-5	4052	--	--	--
Mercury	2.3	0-1	4053	--	--	--
Zinc	160	0-1	4056	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-5b-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5b

AVERAGE SITE DEPTH TO GROUNDWATER: 18 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,2-DICHLOROETHANE	40	35020	12/9/88
ALDRIN	0.12	35020	06/2/88
ATRAZINE	100	35020	12/9/88
CHLOROFORM	2.0	35020	12/9/88
HEXACHLOROCYCLOPENTADIENE	0.11	35020	06/2/88
CHLORDANE	3.4	35020	12/9/88
DIISOPROPYLMETHYL PHOSPHONATE	200	35020	12/9/88
DITHIANE	350	35020	12/9/88
DIELDRIN	1.2	35020	12/9/88
DIMETHYLMETHYL PHOSPHONATE	3.6	35020	12/9/88
ENDRIN	0.84	35020	12/9/88
ISODRIN	0.19	35020	06/2/88
TOLUENE	21	35020	12/9/88
1,4-OXATHIANE	14	35020	12/9/88
PPDDT	0.25	35020	12/9/88
TRICHLOROETHYLENE	1.4	35020	12/9/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

NCSA-5b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	6.8E+08	1.5E+00	4.3E+00*	9.5E-09	4.3E+00*	4.0E-11
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-16
CHLORDANE	2.0E+01	7.3E+10	2.0E+01	5.1E-01*	1.4E-10	5.1E-01*	5.3E-11
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-10
PPDE	7.4E+01	4.1E+10	7.4E+01	2.2E-04	3.9E-13	2.2E-04	0.0E+00
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	5.8E-11
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	9.3E-09
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	7.6E+00*	3.9E-08a	7.6E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	2.6E+09	6.6E+05	7.6E-06	1.9E-09	7.6E-06	1.9E-12
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	3.6E-04	0.0E+00	3.6E-04	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	1.4E-03	1.4E-11a	1.4E-03	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	8.0E-02	0.0E+00	8.0E-02	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-10
ISODRIN	5.8E+02	4.9E+10	5.8E+02	2.1E-05	2.4E-13	2.1E-05	2.6E-12
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	2.3E-06	0.0E+00	2.3E-06	0.0E+00
METHYLENE CHLORIDE	3.3E+03	1.7E+07	3.3E+03	3.1E-04	5.9E-08	3.1E-04	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,1,2,2-TETRACHLOROETHANE	1.3E+02	2.3E+07	1.3E+02	0.0E+00	2.6E-07	2.6E-07	0.0E+00
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.3E-10
ARSENIC	2.2E+01	0.0E+00	2.2E+01	8.8E+00*	0.0E+00	8.8E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	7.3E-03	0.0E+00	7.3E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	8.4E-03	0.0E+00	8.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	7.0E-04	0.0E+00	7.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	8.1E-05	0.0E+00	8.1E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5b-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	6.8E+08	1.5E+00	4.3E+00*	9.5E-09	4.3E+00*	4.0E-11
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-16
CHLORDANE	2.0E+01	7.3E+10	2.0E+01	5.1E-01*	1.4E-10	5.1E-01*	5.3E-11
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-10
PPDDE	7.4E+01	4.1E+10	7.4E+01	2.2E-04	3.9E-13	2.2E-04	0.0E+00
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	5.8E-11
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	9.3E-09
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	7.6E+00*	3.9E-08a	7.6E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	2.6E+09	6.6E+05	7.6E-06	1.9E-09	7.6E-06	1.9E-12
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	3.6E-04	0.0E+00	3.6E-04	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	1.4E-03	1.4E-11a	1.4E-03	0.0E+00
FLUOROACETIC ACID	3.9E+01	0.0E+00	3.9E+01	8.0E-02	0.0E+00	8.0E-02	0.0E+00
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-10
ISODRIN	5.8E+02	4.9E+10	5.8E+02	2.1E-05	2.4E-13	2.1E-05	2.6E-12
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+06	0.0E+00	2.5E+06	2.3E-06	0.0E+00	2.3E-06	0.0E+00
METHYLENE CHLORIDE	3.3E+03	1.7E+07	3.3E+03	3.1E-04	5.9E-08	3.1E-04	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,1,2,2-TETRACHLOROETHANE	1.3E+02	2.3E+07	1.3E+02	0.0E+00	2.6E-07	2.6E-07	0.0E+00
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.3E-10
ARSENIC	2.2E+01	0.0E+00	2.2E+01	8.8E+00*	0.0E+00	8.8E+00*	0.0E+00
CADMIUM	4.5E+02	0.0E+00	4.5E+02	7.3E-03	0.0E+00	7.3E-03	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	8.4E-03	0.0E+00	8.4E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	7.0E-04	0.0E+00	7.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	8.1E-05	0.0E+00	8.1E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5b-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPW
ALDRIN	2.1E-01	4.5E+07	2.1E-01	3.1E+01*	1.4E-07	3.1E+01*	6.0E-10
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	9.1E-16
CHLORDANE	2.7E+00	4.9E+09	2.7E+00	3.7E+00*	2.1E-09	3.7E+00*	8.0E-10
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-09
PPDDE	1.0E+01	2.7E+09	1.0E+01	1.6E-03	5.9E-12	1.6E-03	0.0E+00
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	8.8E-10
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-07
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	5.5E+01*	5.8E-07a	5.5E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	1.9E+09	2.8E+05	1.8E-05	2.7E-09	1.8E-05	1.2E-11
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	8.5E-04	0.0E+00	8.5E-04	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	3.3E-03	9.0E-11a	3.3E-03	0.0E+00
FLUOROACETIC ACID	1.7E+01	0.0E+00	1.7E+01	1.9E-01*	0.0E+00	1.9E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	2.6E-09
ISODRIN	2.5E+02	7.6E+09	2.5E+02	4.9E-05	1.6E-12	4.9E-05	1.7E-11
ISOPROPYL METHYL PHOSPHONIC ACID	1.1E+06	0.0E+00	1.1E+06	5.4E-06	0.0E+00	5.4E-06	0.0E+00
METHYLENE CHLORIDE	4.5E+02	2.6E+06	4.5E+02	2.2E-03	3.8E-07	2.2E-03	0.0E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,1,2,2-TETRACHLOROETHANE	1.8E+01	1.5E+06	1.8E+01	0.0E+00	3.9E-06	3.9E-06	0.0E+00
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	8.6E-12
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	7.9E-09
ARSENIC	3.9E+00	0.0E+00	3.9E+00	4.8E+01*	0.0E+00	4.8E+01*	0.0E+00
CADMIUM	5.8E+01	0.0E+00	5.8E+01	5.7E-02	0.0E+00	5.7E-02	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	2.3E-04	0.0E+00	2.3E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.4E-02	0.0E+00	1.4E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	1.2E-03	0.0E+00	1.2E-03	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.5E-04	0.0E+00	1.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	3.4E+00*	1.6E+01*	2.0E+01*	4.6E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-09
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.0E-01*	7.4E-04	4.1E-01*	6.1E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-03
PPDDE	9.3E+01	1.9E+01	1.6E+01	1.7E-04	8.2E-04	9.9E-04	0.0E+00
PPDOT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	6.7E-04
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-01
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	6.0E+00*	2.1E-01*	6.2E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	1.4E-05	3.1E-02	3.1E-02	6.6E-05
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	6.5E-04	0.0E+00	6.5E-04	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	2.5E-03	2.3E-04a	2.8E-03	0.0E+00
FLUOROACETIC ACID	2.2E+01	0.0E+00	2.2E+01	1.4E-01*	0.0E+00	1.4E-01*	0.0E+00
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-02
ISODRIN	3.2E+02	6.7E+01	5.5E+01	3.7E-05	1.8E-04	2.2E-04	9.0E-05
ISOPROPYL METHYL PHOSPHONIC ACID	1.4E+06	0.0E+00	1.4E+06	4.1E-06	0.0E+00	4.1E-06	0.0E+00
METHYLENE CHLORIDE	4.1E+03	1.8E+00	1.8E+00	2.4E-04	5.4E-01*	5.4E-01*	0.0E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,1,2,2-TETRACHLOROETHANE	1.6E+02	2.8E+00	2.7E+00	0.0E+00	2.2E+00*	2.2E+00*	0.0E+00
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	4.6E-05
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	6.0E-03
ARSENIC	2.0E+01	0.0E+00	2.0E+01	9.5E+00*	0.0E+00	9.5E+00*	0.0E+00
CADMIUM	3.6E+02	0.0E+00	3.6E+02	9.2E-03	0.0E+00	9.2E-03	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	3.2E-04	0.0E+00	3.2E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	2.0E-02	0.0E+00	2.0E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.7E-03	0.0E+00	1.7E-03	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	2.0E-04	0.0E+00	2.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	9.1E+07	4.0E-01	9.0E-02	5.6E+01*	1.6E+01*	7.2E+01*	3.0E-10	1.4E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-15	4.8E-09
CHLORDANE	1.5E+00	9.8E+09	5.2E+00	1.2E+00	6.6E+00*	1.9E+00*	8.5E+00*	4.0E-10	1.8E-03
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-10	4.2E-03
PPDE	5.7E+00	5.5E+09	1.9E+01	4.4E+00	2.8E-03	8.2E-04	3.6E-03	0.0E+00	0.0E+00
PPDOT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-10	2.0E-03
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-08	3.2E-01
DIELDRIN	1.2E-01	4.1E+07	1.9E+01	1.2E-01	9.8E+01*	6.3E-01*	9.9E+01*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	3.5E+08	1.6E+02	1.6E+02	7.4E-05	3.1E-02	3.1E-02	1.4E-11	6.6E-05
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	3.5E-03	0.0E+00	3.5E-03	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	1.4E-02	2.3E-04a	1.4E-02	0.0E+00	0.0E+00
FLUOROACETIC ACID	4.0E+00	0.0E+00	0.0E+00	4.0E+00	7.8E-01*	0.0E+00	7.8E-01*	0.0E+00	0.0E+00
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-09	1.4E-02
ISODRIN	5.9E+01	6.6E+09	2.0E+02	4.6E+01	2.0E-04	6.0E-05	2.6E-04	2.0E-11	9.0E-05
ISOPROPYL METHYL PHOSPHONIC ACID	2.5E+05	0.0E+00	0.0E+00	2.5E+05	2.2E-05	0.0E+00	2.2E-05	0.0E+00	0.0E+00
METHYLENE CHLORIDE	2.5E+02	2.2E+06	1.8E+00	1.8E+00	4.0E-03	5.4E-01*	5.5E-01*	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,1,2,2-TETRACHLOROETHANE	9.9E+00	3.1E+06	9.3E-01	8.5E-01	0.0E+00	6.5E+00*	6.5E+00*	0.0E+00	0.0E+00
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-11	4.6E-05
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	3.9E-09	1.8E-02
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.2E+02*	0.0E+00	1.2E+02*	0.0E+00	0.0E+00
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	4.3E-01*	0.0E+00	4.3E-01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	9.8E-04	0.0E+00	9.8E-04	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	5.9E-02	0.0E+00	5.9E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	5.0E-03	0.0E+00	5.0E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.1E-03	0.0E+00	1.1E-03	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.17 SITE NCSA-5c: SAND CREEK LATERAL (formerly Section 35-Uncontaminated; ESE, 1987m/RIC 87313R01; formerly Section 35-Nonsource Area; ESE, 1988t/RIC 87313R01A)

2.17.1 Site-Specific Considerations

Figure NCSA-5c-1 and Tables NCSA-5c-1 and NCSA-5c-2 depict the target contaminants for site NCSA-5c. Borings 4090 through 4097, 4123 through 4126, and 4128 through 4131 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-5c (ESE, 1987m/RIC 87313R01).

2.17.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-5c are shown in Figure NCSA-5c-1. Table NCSA-5c-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-5c-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.17.3 Site Exposure Summary

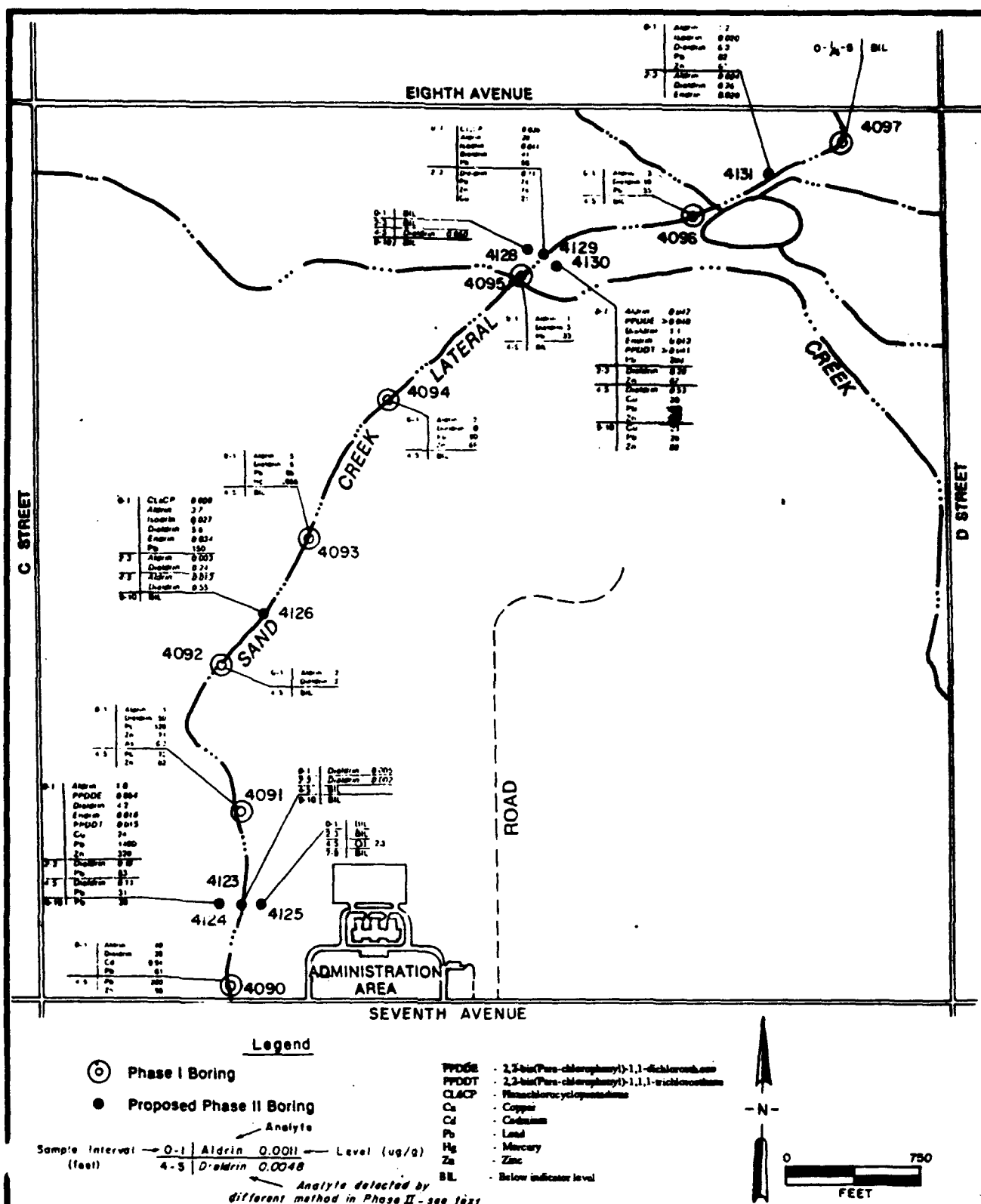
Tables NCSA-5c-3 through NCSA-5c-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-5c is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Lead	--	--	Direct	Direct	Direct
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-5c is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland
 SOURCE: ESE, 1987

FIGURE NCSA-5c-1
 Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels
 Rocky Mountain Arsenal
 Prepared by: Ebasco Services Incorporated

TABLE NCSA-5c-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-5c

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	40	0-1	4090	40	0-1	4090
PPDDE ^{1/}	0.054	0-1	4124	0.054	0-1	4124
PPDDT ^{2/}	>0.041	0-1	4130	>0.041	0-1	4130
Dieldrin	50	0-1	4091	50	0-1	4091
Endrin	0.034	0-1	4126	0.034	0-1	4126
Hexachlorocyclopentadiene	0.036	0-1	4129	0.036	0-1	4129
Isodrin	0.041	0-1	4129	0.041	0-1	4129
Cadmium	2.3	4-5	4125	--	--	--
Lead	1400	0-1	4124	--	--	--
Zinc	320	0-1	4124	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene
2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

NCSA
Max.
ug/g
ft
North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-5c-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5c
AVERAGE SITE DEPTH TO GROUNDWATER: 43 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	2.4	26073	07/25/88
1,2-DICHLOROETHANE	20	26073	05/4/88
ALDRIN	0.44	26158	01/24/89
ATRAZINE	53	35079	12/1/88
BENZENE	8.7	35087	06/9/88
CARBON TETRACHLORIDE	5.9	26073	11/14/88
CHLOROFORM	460	35091	01/23/89
HEXACHLOROCYCLOPENTADIENE	0.10	35079	12/1/88
CHLOROBENZENE	150	26159	01/24/89
CHLORDANE	0.62	35058	12/14/88
CHLOROPHENYLMETHYL SULFIDE	6.8	35079	06/9/88
CHLOROPHENYLMETHYL SULFONE	8.1	35079	11/30/88
DIISOPROPYLMETHYL PHOSPHONATE	2000	35079	12/1/88
DITHIANE	840	35079	12/1/88
DIELDRIN	86	35058	12, 14/88
DIMETHYLMETHYL PHOSPHONATE	0.50	26073	02/15/89
ENDRIN	0.41	35079	12/1/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-5c-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5c
AVERAGE SITE DEPTH TO GROUNDWATER: 43 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ISODRIN	0.90	35079	12/1/88
TOLUENE	1.5	26159	01/24/89
MALATHION	7.2	35079	12/1/88
1,4-OXATHIANE	73	35079	12/1/88
PPDDE	0.61	26073	01/26/88
PPDDT	0.39	35079	12/1/88
SUPONA	1.2	35079	12/1/88
TETRACHLOROETHYLENE	1.6	26073	07/25/88
TRICHLOROETHYLENE	5.8	26159	01/24/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-5c-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	5.9E+05	1.5E+00	2.7E+01*	6.8E-05	2.7E+01*	7.3E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-06
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-05
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	4.7E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.8E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.8E-12
PPDDE	7.4E+01	3.5E+07	7.4E+01	7.3E-04	1.5E-09	7.3E-04	9.5E-09
PPDDT	7.4E+01	7.5E+07	7.4E+01	5.6E-04	5.5E-10	5.6E-04	4.3E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.2E+01*	1.9E-04a	3.2E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	9.3E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	2.2E+08	2.5E+03	1.4E-05	1.6E-10	1.4E-05	4.6E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	1.8E+04	8.6E+03	2.2E-06	2.0E-06	4.2E-06	1.8E-07
ISODRIN	5.8E+02	4.3E+07	5.8E+02	7.1E-05	9.6E-10	7.1E-05	6.1E-09
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-14
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.6E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.9E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-06
CADMIUM	4.5E+02	0.0E+00	4.5E+02	5.1E-03	0.0E+00	5.1E-03	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	9.1E-02	0.0E+00	9.1E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	1.6E-04	0.0E+00	1.6E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5c-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	5.9E+05	1.5E+00	2.7E+01*	6.8E-05	2.7E+01*	7.3E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-06
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-05
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	4.7E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.8E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.8E-12
PPDE	7.4E+01	3.5E+07	7.4E+01	7.3E-04	1.5E-09	7.3E-04	9.5E-09
PPDDT	7.4E+01	7.5E+07	7.4E+01	5.6E-04	5.5E-10	5.6E-04	4.3E-03
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-06
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.2E+01*	1.9E-04a	3.2E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	9.3E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	2.2E+08	2.5E+03	1.4E-05	1.6E-10	1.4E-05	4.6E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	1.8E+04	8.6E+03	2.2E-06	2.0E-06	4.2E-06	1.8E-07
ISODRIN	5.8E+02	4.3E+07	5.8E+02	7.1E-05	9.6E-10	7.1E-05	6.1E-09
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-14
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.6E-11
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.9E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-06
CADMIUM	4.5E+02	0.0E+00	4.5E+02	5.1E-03	0.0E+00	5.1E-03	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	9.1E-02	0.0E+00	9.1E-02	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	1.6E-04	0.0E+00	1.6E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5c-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	3.9E+04	2.1E-01	1.9E+02*	1.0E-03	1.9E+02*	1.1E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	2.3E-13
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-05
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-04
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	7.0E-08
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-06
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-04
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-09
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-11
PPDDE	1.0E+01	2.4E+06	1.0E+01	5.3E-03	2.3E-08	5.3E-03	1.4E-07
PPDDT	1.0E+01	5.0E+06	1.0E+01	4.0E-03	8.3E-09	4.0E-03	6.5E-07
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-05
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	2.3E+02*	2.8E-03a	2.3E+02*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	6.0E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	3.4E+07	1.1E+03	3.2E-05	1.0E-09	3.2E-05	3.0E-11
HEXACHLOROCYCLOPENTADIENE	5.7E+03	6.5E+03	3.0E+03	6.4E-06	5.6E-06	1.2E-05	1.1E-06
ISODRIN	2.5E+02	6.6E+06	2.5E+02	1.7E-04	6.2E-09	1.7E-04	3.9E-08
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-13
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	5.4E-14
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	2.2E-06
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	3.0E-10
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.9E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-05
CADMIUM	5.8E+01	0.0E+00	5.8E+01	4.0E-02	0.0E+00	4.0E-02	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	1.5E-01*	0.0E+00	1.5E-01*	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	3.0E-04	0.0E+00	3.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5c-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	2.1E+01*	3.2E-01*	2.1E+01*	4.3E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-10
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-02
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-01
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-05
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-03
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-02
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	8.6E-06
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-07
PPDE	9.3E+01	1.9E+01	1.6E+01	5.8E-04	2.8E-03	3.4E-03	5.7E-05
PPDDT	9.3E+01	1.9E+01	1.6E+01	4.4E-04	2.1E-03	2.5E-03	2.6E-04
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-02
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	2.5E+01*	8.7E-01*	2.6E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	1.6E+04	1.3E+03	2.5E-05	2.2E-06	2.7E-05	8.3E-08
HEXACHLOROCYCLOPENTADIENE	5.5E+03	1.9E+01	1.9E+01	6.6E-06	1.9E-03	1.9E-03	1.2E-03
ISODRIN	3.2E+02	6.7E+01	5.5E+01	1.3E-04	6.1E-04	7.4E-04	1.1E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-09
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	8.8E-04
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	8.3E-07
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	5.2E-06
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	6.2E-03
CADMIUM	3.6E+02	0.0E+00	3.6E+02	6.4E-03	0.0E+00	6.4E-03	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	2.1E-01*	0.0E+00	2.1E-01*	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	4.1E-04	0.0E+00	4.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form

NCSA-5c-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	7.8E+04	4.2E+01	1.2E-01	3.4E+02*	9.5E-01*	3.4E+02*	5.4E-07	1.3E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	2.7E-13	6.5E-10
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-05	3.2E-02
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-04	3.7E-01
CHLORDANE	1.5E+03	0.0E+00	0.0E+00	1.5E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-08	8.4E-05
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-06	4.7E-03
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04	2.5E-01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-09	8.6E-06
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.1E-11	1.2E-07
PPDDE	5.7E+00	4.7E+06	1.9E+01	4.4E+00	9.4E-03	2.8E-03	1.2E-02	7.1E-08	1.7E-04
PPDDT	5.7E+00	1.0E+07	1.9E+01	4.4E+00	7.2E-03	2.1E-03	9.3E-03	3.2E-07	7.8E-04
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-05	4.1E-02
DIELDRIN	1.2E-01	3.6E+04	1.9E+01	1.2E-01	4.1E+02*	2.6E+00*	4.1E+02*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	7.0E-08	1.7E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	2.9E+07	1.6E+04	2.5E+02	1.3E-04	2.2E-06	1.4E-04	3.5E-11	8.3E-08
HEXACHLOROCYCLOPENTADIENE	3.8E+02	2.4E+03	5.8E+01	4.9E+01	9.4E-05	6.4E-04	7.3E-04	1.3E-06	3.2E-03
ISODRIN	5.9E+01	5.7E+06	2.0E+02	4.6E+01	6.9E-04	2.0E-04	9.0E-04	4.6E-08	1.1E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-13	1.2E-09
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	6.3E-14	1.5E-10
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-06	2.6E-03
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-10	8.3E-07
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-09	5.2E-06
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	7.7E-06	1.8E-02
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	3.0E-01*	0.0E+00	3.0E-01*	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	6.4E-01*	0.0E+00	6.4E-01*	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	2.3E-03	0.0E+00	2.3E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.18 SITE NCSA-5d: SURFACE DRAINAGE CANAL (formerly Section 35-Uncontaminated; ESE, 1987m/RIC 87313R01; formerly Section 35-Nonsource Area; ESE 1988t/RIC87313R01A)

2.18.1 Site-Specific Considerations

Figure NCSA-5d-1 and Tables NCSA-5d-1 and NCSA-5d-2 depict the target contaminants for site NCSA-5d. Borings 4027, 4043, 4095, 4127, and 4132 through 4134 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-5d (ESE, 1987m/RIC 87313R01).

2.18.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-5d are shown in Figure NCSA-5d-1. Table NCSA-5d-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-5d-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.18.3 Site Exposure Summary

Tables NCSA-5d-3 through NCSA-5d-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-5d is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Cadmium	--	--	Direct	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-5d is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminant results in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Chloroform (enclosed)

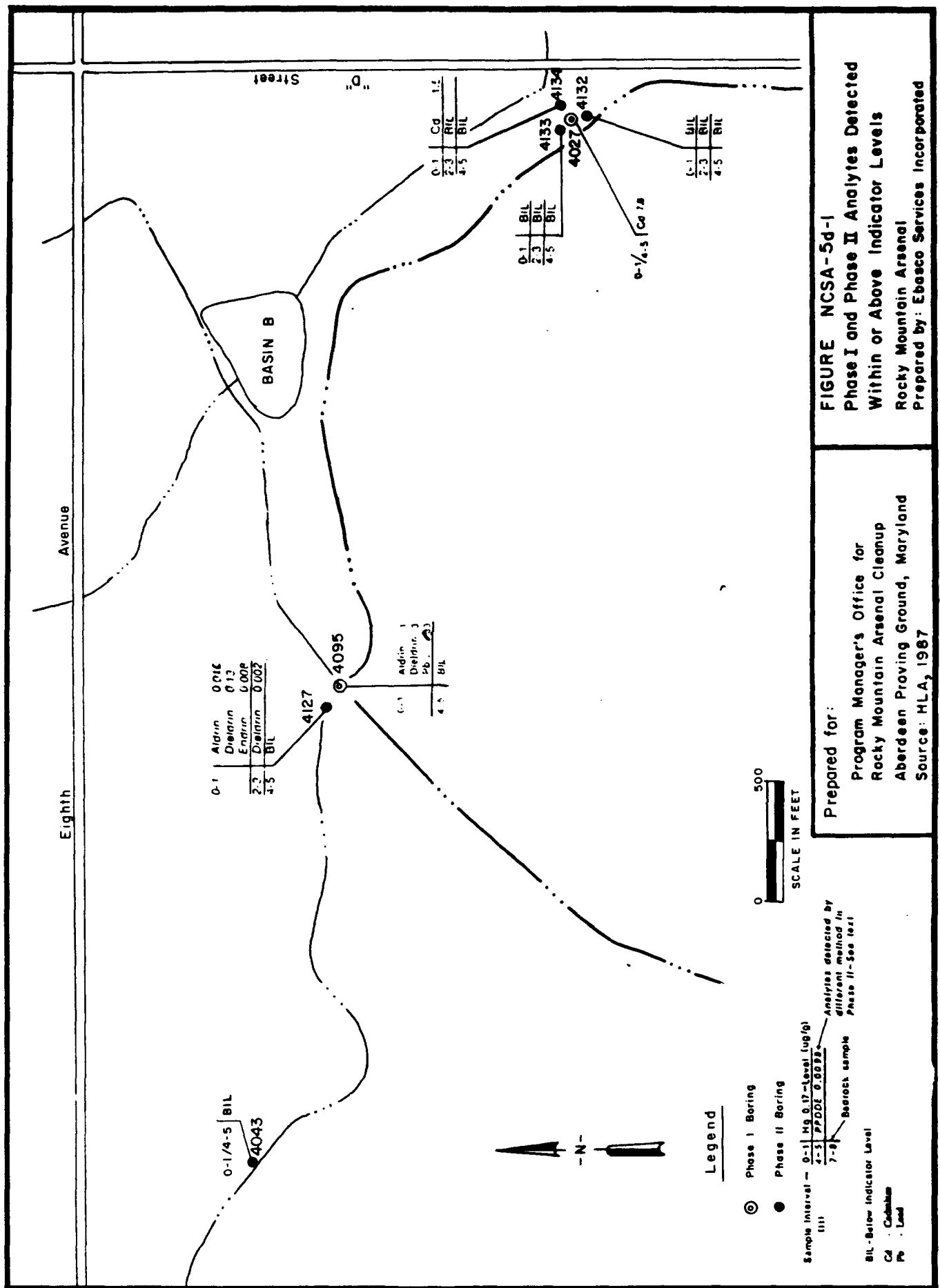


FIGURE NCSA-5d-1
Phase I and Phase II Analytes Detected
Within or Above Indicator Levels
Rocky Mountain Arsenal
Prepared by: Ebasco Services Incorporated

Prepared for:
Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland
Source: MLA, 1987

TABLE NCSA-5d-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-5d

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	1	0-1	4095	1	0-1	4095
Dieldrin	3	0-1	4095	3	0-1	4095
Endrin	0.008	0-1	4127	0.008	0-1	4127
Cadmium	7.8	Comp ^{1/} 0-1, 4-5	4027	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-5d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5d

AVERAGE SITE DEPTH TO GROUNDWATER: 25 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	1.8	35023	02/3/88
1,2-DICHLOROETHANE	40	35020	12/9/88
ALDRIN	0.21	35091	01/23/89
ATRAZINE	100	35020	12/9/88
CARBON TETRACHLORIDE	1.3	35023	02/3/88
CHLOROFORM	1700	35023	12/9/88
HEXACHLOROCYCLOPENTADIENE	0.22	35023	12/9/88
CHLOROBENZENE	70	35091	01/23/89
CHLORDANE	3.4	35020	12/9/88
CHLOROPHENYLMETHYL SULFOXIDE	22	35023	02/3/88
CHLOROPHENYLMETHYL SULFONE	21	35023	12/9/88
DIBROMOCHLOROPROPANE	6.3	35023	12/9/88
DIISOPROPYLMETHYL PHOSPHONATE	1700	35077	06/2/88
DITHIANE	350	35020	12/9/88
DIELDRIN	1.2	35020	12/9/88
DIMETHYLMETHYL PHOSPHONATE	3.6	35020	12/9/88
ENDRIN	0.84	35020	12/9/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

TABLE NCSA-5d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-5d
AVERAGE SITE DEPTH TO GROUNDWATER: 25 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ISODRIN	0.19	35020	06/2/88
TOLUENE	21	35020	12/9/88
1,4-OXATHIANE	14	35020	12/9/88
PPDDT	0.25	35020	12/9/88
PARATHION	9.8	35023	12/9/88
TETRACHLOROETHYLENE	4.7	35023	12/9/88
TRICHLOROETHYLENE	4.2	35091	01/23/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-5d-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPM
ALDRIN	1.5E+00	1.3E+06	1.5E+00	6.7E-01*	7.9E-07	6.7E-01*	2.7E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-14
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.8E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.1E-05
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-11
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-06
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-06
DIELDRIN	1.6E+00	5.8E+05	1.6E+00	1.9E+00*	5.2E-06	1.9E+00*	4.5E-09
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	6.3E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.7E+08	2.5E+03	3.2E-06	1.7E-11	3.2E-06	7.5E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-09
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.4E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	5.2E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.9E-07
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.7E-02	0.0E+00	1.7E-02	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5d-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.3E+06	1.5E+00	6.7E-01*	7.9E-07	6.7E-01*	2.7E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-14
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.8E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.1E-05
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-11
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-06
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.6E-06
DIELDRIN	1.6E+00	5.8E+05	1.6E+00	1.9E+00*	5.2E-06	1.9E+00*	4.5E-09
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	6.3E-09
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	4.7E+08	2.5E+03	3.2E-06	1.7E-11	3.2E-06	7.5E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-09
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-12
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.4E-07
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	5.2E-10
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.9E-07
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.7E-02	0.0E+00	1.7E-02	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5d-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	8.4E+04	2.1E-01	4.8E+00*	1.2E-05	4.8E+00*	4.1E-07
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-13
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-05
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-07
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	6.3E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	6.2E-04
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	9.3E-11
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-10
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-07
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-05
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-05
DIELDRIN	2.2E-01	3.8E+04	2.2E-01	1.4E+01*	7.9E-05	1.4E+01*	6.7E-08
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	4.1E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	7.2E+07	1.1E+03	7.6E-06	1.1E-10	7.6E-06	4.9E-11
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	2.0E-06
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-09
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-11
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-06
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	3.4E-09
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	8.9E-06
CADMIUM	5.8E+01	0.0E+00	5.8E+01	1.4E-01*	0.0E+00	1.4E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5d-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	4.0E-01	3.3E-01	5.3E-01*	2.5E+00*	3.1E+00*	4.4E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	2.7E-09
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	5.8E-02
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	3.3E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-03
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	6.7E-01
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	7.0E-07
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-06
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-04
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-02
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.8E-02
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.5E+00*	5.2E-02	1.6E+00*	7.2E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	3.1E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	2.9E+02	2.4E+02	5.8E-06	2.8E-05	3.4E-05	3.7E-07
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-02
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-05
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	8.3E-08
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-03
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	2.5E-05
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	8.4E-06
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	9.5E-03
CADMIUM	3.6E+02	0.0E+00	3.6E+02	2.2E-02	0.0E+00	2.2E-02	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-5d-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPW	ENC
ALDRIN	1.2E-01	1.7E+05	4.0E-01	9.0E-02	8.6E+00*	2.5E+00*	1.1E+01*	2.1E-07	1.3E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	4.1E-13	2.7E-09
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-05	1.7E-01
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-07	1.0E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	7.4E-07	4.8E-03
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-04	2.0E+00
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-10	7.0E-07
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-10	1.4E-06
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-07	1.1E-03
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-05	1.0E-01
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-05	1.7E-01
DIELDRIN	1.2E-01	7.7E+04	1.9E+01	1.2E-01	2.5E+01*	1.6E-01*	2.5E+01*	3.4E-08	2.2E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-08	3.1E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	6.2E+07	8.6E+02	2.0E+02	3.2E-05	9.3E-06	4.1E-05	5.7E-11	3.7E-07
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-06	1.5E-02
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	7.7E-09	4.9E-05
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-11	8.3E-08
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.6E-06	1.6E-02
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-09	2.5E-05
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-09	8.4E-06
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	4.4E-06	2.9E-02
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	1.0E+00*	0.0E+00	1.0E+00*	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.19 SITE NCSA-6a: CHEMICAL SEWERS FROM SOUTH PLANTS (formerly Site 35-2/26-9: Chemical Sewer; ESE, 1988u/RIC 88133R02)

2.19.1 Site-Specific Considerations

Figure NCSA-6a-1 and Table NCSA-6a-1 depict the target contaminants for site NCSA-6a. Borings 4057 through 4069 and 4632 through 4638 were included in this exposure assessment, consistent with the North Central SAR. Since this site is a sewer line, most of the chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-6a (ESE, 1988u/RIC 88133R02).

2.19.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-6a are shown in Figure NCSA-6a-1. Tetrachlorobenzene, occurring in Boring 4063 (10-11 ft and 11-12 ft) was not included in the figure, since it was not considered a target contaminant during the Phase I investigation. Although not shown on this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-6a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No groundwater data table was included for Site NCSA-6a since this site is a sewer line (see Volume VI-A).

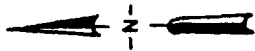
2.19.3 Site Exposure Summary

Tables NCSA-6a-2 through NCSA-6a-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

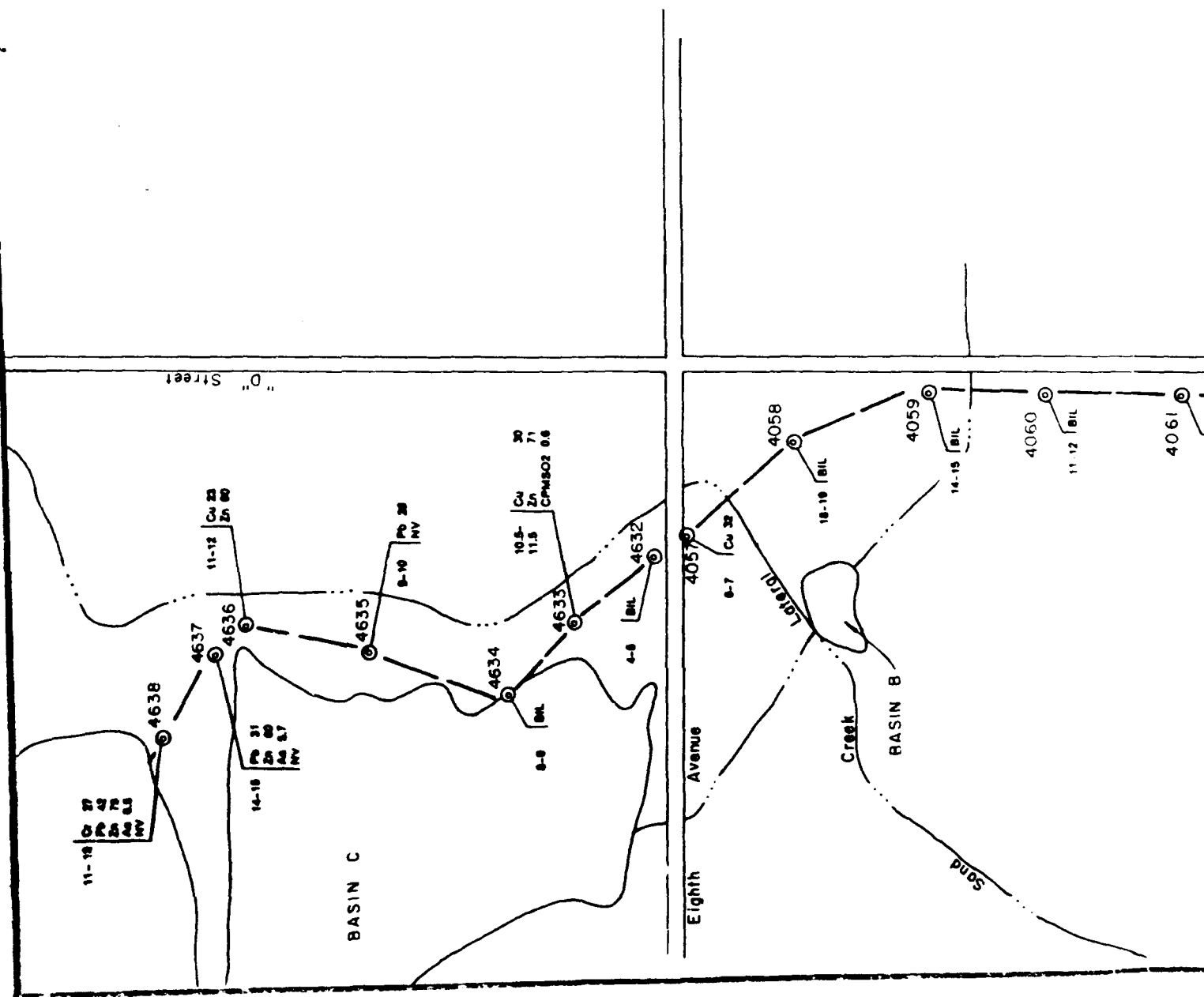
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Chloroform	--	--	--	Indirect	Indirect
Dieldrin	--	--	--	Indirect	Indirect
Dimethyldisulfide	--	--	--	Indirect	Indirect
Aldrin	--	--	--	--	Indirect

Note: Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the indirect pathways are the primary contributors to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-6a is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).



0 2000'
SCALE APPROXIMATE



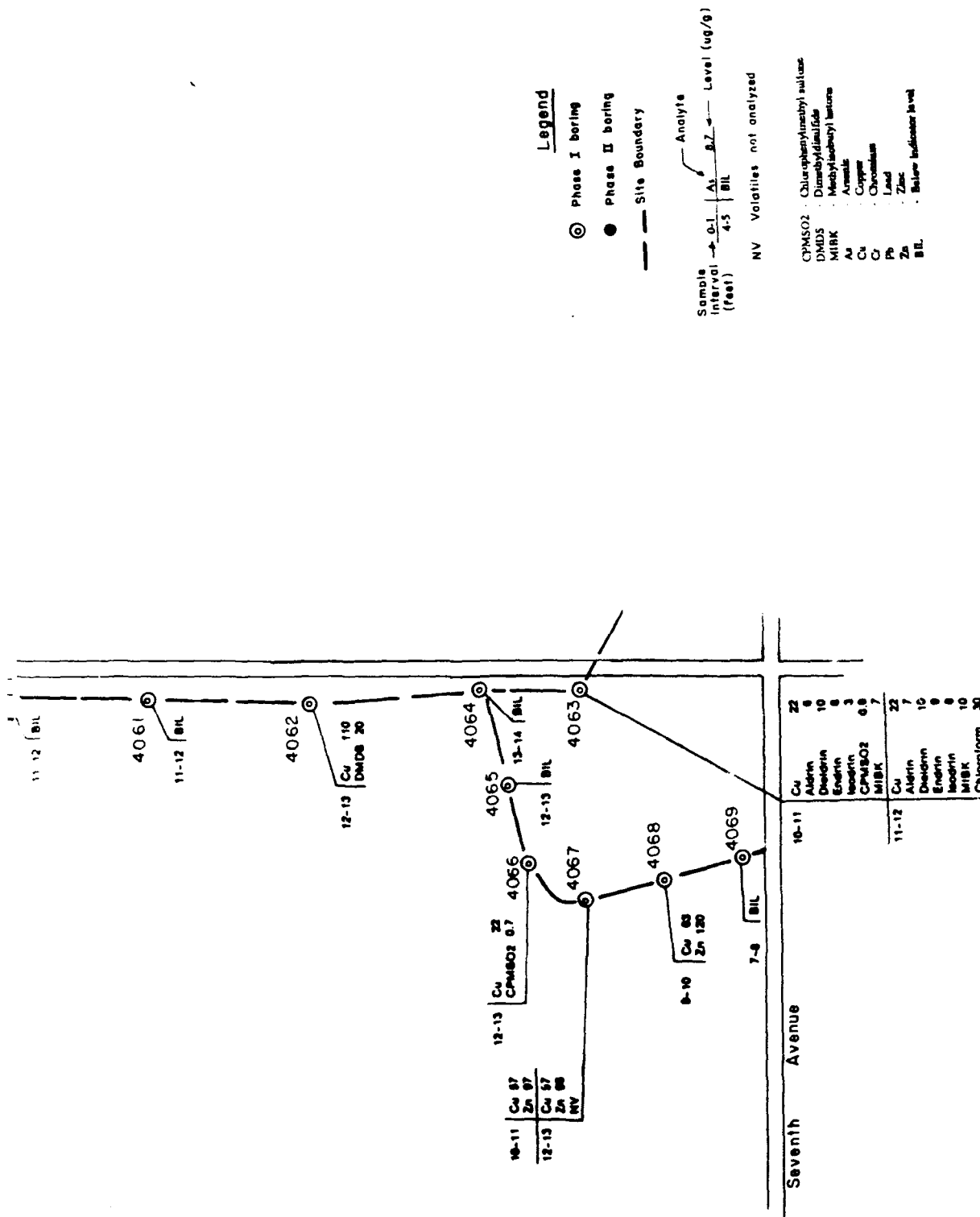


TABLE NCSA-6a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-6a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	--	--	--	7	11-12	4063
Chloroform	--	--	--	30	11-12	4063
Chlorophenylmethyl sulfone	--	--	--	0.9	10-11	4063
Dieldrin	--	--	--	10	10-11	4063
	--	--	--		11-12	4063
Dimethyldisulfide	--	--	--	20	12-13	4062
Endrin	--	--	--	9	11-12	4063
Isodrin	--	--	--	6	11-12	4063
Methylisobutyl ketone	--	--	--	10	11-12	4063
Tetrachlorobenzene ^{1/}	--	--	--	0.20	10-11	4063
Copper	63	9-10	4068	--	--	--
Zinc	120	9-10	4068	--	--	--

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

NCSA-6a-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPW
ALDRIN	1.5E+00	8.9E+05	1.5E+00	0.0E+00	7.9E-06	7.9E-06	0.0E+00
CHLOROFORM	4.0E+03	3.4E+05	4.0E+03	0.0E+00	8.8E-05	8.8E-05	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.4E+07	1.6E+05	0.0E+00	6.3E-08	6.3E-08	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	0.0E+00	2.5E-05a	2.5E-05	0.0E+00
DIMETHYLDISULFIDE	6.7E+04	2.2E+06	6.5E+04	0.0E+00	8.9E-06	8.9E-06	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	0.0E+00	2.7E-08a	2.7E-08	0.0E+00
ISODRIN	5.8E+02	6.4E+07	5.8E+02	0.0E+00	9.3E-08	9.3E-08	0.0E+00
METHYLISSOBUTYL KETONE	4.1E+05	3.2E+06	3.6E+05	0.0E+00	3.1E-06	3.1E-06	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.5E-04	0.0E+00	1.5E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6a-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	8.9E+05	1.5E+00	0.0E+00	7.9E-06	7.9E-06	0.0E+00
CHLOROFORM	4.0E+03	3.4E+05	4.0E+03	0.0E+00	8.8E-05	8.8E-05	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.6E+05	1.4E+07	1.6E+05	0.0E+00	6.3E-08	6.3E-08	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	0.0E+00	2.5E-05a	2.5E-05	0.0E+00
DIMETHYLDISULFIDE	5.7E+04	2.2E+06	6.5E+04	0.0E+00	8.9E-06	8.9E-06	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	0.0E+00	2.7E-08a	2.7E-08	0.0E+00
ISODRIN	5.8E+02	6.4E+07	5.8E+02	0.0E+00	9.3E-08	9.3E-08	0.0E+00
METHYLISOBUTYL KETONE	4.1E+05	3.2E+06	3.6E+05	0.0E+00	3.1E-06	3.1E-06	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.5E-04	0.0E+00	1.5E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6a-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	5.9E+04	2.1E-01	0.0E+00	1.2E-04	1.2E-04	0.0E+00
CHLOROFORM	5.6E+02	5.3E+04	5.6E+02	0.0E+00	5.7E-04	5.7E-04	0.0E+00
CHLOROPHENYLMETHYL SULFONE	7.0E+04	2.2E+06	6.8E+04	0.0E+00	4.1E-07	4.1E-07	0.0E+00
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	0.0E+00	3.7E-04a	3.7E-04	0.0E+00
DIMETHYLDISULFIDE	2.9E+04	8.1E+05	2.8E+04	0.0E+00	2.5E-05	2.5E-05	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	0.0E+00	1.8E-07a	1.8E-07	0.0E+00
ISODRIN	2.5E+02	1.0E+07	2.5E+02	0.0E+00	6.0E-07	6.0E-07	0.0E+00
METHYLISOBUTYL KETONE	1.7E+05	1.2E+06	1.5E+05	0.0E+00	8.6E-06	8.6E-06	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	2.5E-04	0.0E+00	2.5E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.1E-04	0.0E+00	1.1E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6a-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	0.0E+00	5.6E-02	5.6E-02	0.0E+00
CHLOROFORM	5.1E+03	1.6E+01	1.6E+01	0.0E+00	1.9E+00*	1.9E+00*	0.0E+00
CHLOROPHENYLMETHYL SULFONE	9.1E+04	6.8E+02	6.7E+02	0.0E+00	1.3E-03	1.3E-03	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	0.0E+00	1.7E-01*	1.7E-01*	0.0E+00
DIMETHYLDISULFIDE	3.7E+04	3.9E+01	3.9E+01	0.0E+00	5.1E-01*	5.1E-01*	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	0.0E+00	5.8E-04a	5.8E-04	0.0E+00
ISODRIN	3.2E+02	3.0E+03	2.9E+02	0.0E+00	2.0E-03	2.0E-03	0.0E+00
METHYLISOBUTYL KETONE	2.2E+05	1.1E+02	1.1E+02	0.0E+00	9.3E-02	9.3E-02	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	3.6E-04	0.0E+00	3.6E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.5E-04	0.0E+00	1.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

NCSA-6a-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	1.2E+05	4.2E+01	1.2E-01	0.0E+00	1.7E-01*	1.7E-01*	0.0E+00	0.0E+00
CHLOROFORM	3.1E+02	4.5E+04	1.6E+01	1.5E+01	0.0E+00	1.9E+00*	1.9E+00*	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.7E+04	1.9E+06	6.8E+02	6.5E+02	0.0E+00	1.3E-03	1.3E-03	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	5.4E+04	1.9E+01	1.2E-01	0.0E+00	5.2E-01*	5.2E-01*	0.0E+00	0.0E+00
DIMETHYLDISULFIDE	6.9E+03	3.0E+05	1.2E+02	1.2E+02	0.0E+00	1.7E-01*	1.7E-01*	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	0.0E+00	5.8E-04a	5.8E-04	0.0E+00	0.0E+00
ISODRIN	5.9E+01	8.6E+06	3.0E+03	5.8E+01	0.0E+00	2.0E-03	2.0E-03	0.0E+00	0.0E+00
METHYL ISOBUTYL KETONE	4.0E+04	4.3E+05	3.2E+02	3.2E+02	0.0E+00	3.1E-02	3.1E-02	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	1.1E-03	0.0E+00	1.1E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	8.6E-04	0.0E+00	8.6E-04	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.20 SITE NCSA-6b: CHEMICAL SEWERS FROM NORTH PLANTS ((formerly Site 36-20: Chemical Sewer; ESE, 1987n/RIC 87133R02 and ESE, 1988v/RIC 87133R02A; Chemical Sewers North Plants and South Plants, EBASCO, 1988g/RIC88286R08)

2.20.1 Site-Specific Considerations

Figure NCSA-6b-1 and Table NCSA-6b-1 depict the target contaminants for Site NCSA-6b. Borings 3137, 3138, 3141, 3144, 3147, 3185 through 3187, 3340, and 3352 through 3369 were included in this exposure assessment, consistent with the North Central SAR. Since this site is a sewer line, many of the chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-6b (ESE, 1987n/RIC 87133R02).

2.20.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-6b are shown in Figure NCSA-6b-1. The following contaminants were not included in this figure, since they were not considered target contaminants during the Phase I and Phase II investigations: Oxybisethanol occurring in Boring 3356, 4-5 ft, and trichloropropene occurring in Boring 3187, 9-10 ft. Although not shown on this figure, oxybisethanol and trichloropropene were included in the North Central SAR and in this exposure assessment because they passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-6b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Methylene chloride, shown in Table NCSA-6b-1 is excluded from consideration in the exposure analysis for this site because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No groundwater data table was included for Site NCSA-6b since this site is a sewer line (see Volume VI-A).

2.20.3 Site Exposure Summary

Tables NCSA-6b-2 through NCSA-6b-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Direct	Dir/Ind
Dieldrin	Direct	Direct	Direct	Dir/Ind	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct
PPDDT	--	--	Direct	--	Direct
Dibromochloropropane	--	--	--	Indirect	Indirect
PPDDE	--	--	--	--	Direct
Isodrin	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-6b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

TABLE NCSA-6b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-6b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	9	4-5	3187	9	4-5	3187
Chlordane	>0.11	4-5	3363	>0.11	4-5	3363
PPDDE ^{1/}	1	4-5	3185	1	4-5	3185
PPDDT ^{2/}	2	9-10	3185	2	9-10	3185
Dibromochloropropane	0.032	4-5	3187	0.032	4-5	3187
Dieldrin	6	4-5	3187	6	4-5	3187
Endrin	6	4-5	3187	6	4-5	3187
Isodrin	7	4-5	3187	7	4-5	3187
Methylene chloride ^{3/}	1.0	4-5	3186	1.0	4-5	3186
Oxybisethanol ^{4/}	0.40	4-5	3356	0.40	4-5	3356
Tetrachloroethylene	0.60	0-1	3185	0.60	0-1	3185
Trichloropropene ^{4/}	0.20	9-10	3187	0.20	9-10	3187
Arsenic	37	9-10	3185	--	--	--
Copper	44	0-1	3186	--	--	--
Lead	89	0-1	3369	--	--	--
Mercury	0.98	0-1	3185	--	--	--
Zinc	130	0-1	3362	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

3/ Suspected laboratory contaminant.

3/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

NCSA-6b-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.3E+07	1.5E+00	6.0E+00*	7.0E-07	6.0E+00*	0.0E+00
CHLORDANE	2.0E+01	2.5E+09	2.0E+01	5.6E-03	4.3E-11	5.6E-03	0.0E+00
PPDDE	7.4E+01	5.4E+08	7.4E+01	1.4E-02	1.8E-09	1.4E-02	0.0E+00
PPDDT	7.4E+01	8.0E+08	7.4E+01	2.7E-02	2.5E-09	2.7E-02	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.9E+02	1.8E+01	1.8E-03	1.7E-05	1.8E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.8E+00*	5.5E-07a	3.8E+00*	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	2.4E-03	1.2E-09a	2.4E-03	0.0E+00
ISODRIN	5.8E+02	2.2E+08	5.8E+02	1.2E-02	3.2E-08	1.2E-02	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	3.8E+05	5.1E+02	1.2E-03	1.6E-06	1.2E-03	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.7E+00*	0.0E+00	1.7E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.8E-03	0.0E+00	5.8E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.0E-04	0.0E+00	3.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.6E-05	0.0E+00	6.6E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6b-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	1.3E+07	1.5E+00	6.0E+00*	7.0E-07	6.0E+00*	0.0E+00
CHLORDANE	2.0E+01	2.5E+09	2.0E+01	5.6E-03	4.3E-11	5.6E-03	0.0E+00
PPODE	7.4E+01	5.4E+08	7.4E+01	1.4E-02	1.8E-09	1.4E-02	0.0E+00
PPDDT	7.4E+01	8.0E+08	7.4E+01	2.7E-02	2.5E-09	2.7E-02	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.9E+02	1.8E+01	1.8E-03	4.7E-05	1.8E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.8E+00*	5.5E-07a	3.8E+00*	0.0E+00
ENDRIN	2.5E+03	1.0E+06	2.5E+03	2.4E-03	1.2E-09a	2.4E-03	0.0E+00
ISODRIN	5.8E+02	2.2E+08	5.8E+02	1.2E-02	3.2E-08	1.2E-02	0.0E+00
TETRACHLOROETHYLENE	5.1E+02	3.8E+05	5.1E+02	1.2E-03	1.6E-06	1.2E-03	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.7E+00*	0.0E+00	1.7E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.1E-04	0.0E+00	1.1E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.8E-03	0.0E+00	5.8E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.0E-04	0.0E+00	3.0E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.6E-05	0.0E+00	6.6E-05	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6b-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	8.5E+05	2.1E-01	4.3E+01*	1.1E-05	4.3E+01*	0.0E+00
CHLORDANE	2.7E+00	1.7E+08	2.7E+00	4.1E-02	6.5E-10	4.1E-02	0.0E+00
PPDE	1.0E+01	3.6E+07	1.0E+01	9.8E-02	2.8E-08	9.8E-02	0.0E+00
PPDDT	1.0E+01	5.3E+07	1.0E+01	2.0E-01*	3.8E-08	2.0E-01*	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	4.0E+01	2.4E+00	1.3E-02	8.0E-04	1.4E-02	0.0E+00
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	2.7E+01*	8.3E-06a	2.7E+01*	0.0E+00
ENDRIN	1.1E+03	1.0E+06	1.1E+03	5.7E-03	7.9E-09a	5.7E-03	0.0E+00
ISODRIN	2.5E+02	3.4E+07	2.5E+02	2.8E-02	2.1E-07	2.8E-02	0.0E+00
TETRACHLOROETHYLENE	7.1E+01	5.9E+04	7.1E+01	8.4E-03	1.0E-05	8.5E-03	0.0E+00
ARSENIC	3.9E+00	0.0E+00	3.9E+00	9.4E+00*	0.0E+00	9.4E+00*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	1.8E-04	0.0E+00	1.8E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	9.6E-03	0.0E+00	9.6E-03	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	5.0E-04	0.0E+00	5.0E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.2E-04	0.0E+00	1.2E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-6b-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PP_V (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	4.8E+00*	7.1E-02	4.8E+00*	0.0E+00
CHLORDANE	2.5E+01	1.4E+04	2.5E+01	4.5E-03	8.1E-06	4.5E-03	0.0E+00
PPDDE	9.3E+01	7.6E+03	9.2E+01	1.1E-02	1.3E-04	1.1E-02	0.0E+00
PPDDT	9.3E+01	1.6E+04	9.2E+01	2.1E-02	1.2E-04	2.2E-02	0.0E+00
DIBROMOCHLOROPROPANE	2.3E+01	3.4E-02	3.4E-02	1.4E-03	9.3E-01*	9.4E-01*	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	3.0E+00*	1.0E-01*	3.1E+00*	0.0E+00
ENDRIN	1.4E+03	1.0E+06	1.3E+03	4.4E-03	3.9E-04a	4.8E-03	0.0E+00
ISODRIN	3.2E+02	3.0E+03	2.9E+02	2.2E-02	2.3E-03	2.4E-02	0.0E+00
TETRACHLOROETHYLENE	6.5E+02	2.0E+03	4.9E+02	9.2E-04	3.0E-04	1.2E-03	0.0E+00
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.9E+00*	0.0E+00	1.9E+00*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	2.5E-04	0.0E+00	2.5E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.4E-02	0.0E+00	1.4E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	7.0E-04	0.0E+00	7.0E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.7E-04	0.0E+00	1.7E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

NCSA-6b-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	1.7E+06	4.2E+01	1.2E-01	7.7E+01*	2.1E-01*	7.8E+01*	0.0E+00	0.0E+00
CHLORDANE	1.5E+00	3.4E+08	4.5E+03	1.5E+00	7.2E-02	2.4E-05	7.2E-02	0.0E+00	0.0E+00
PPODE	5.7E+00	7.2E+07	2.5E+03	5.7E+00	1.7E-01*	3.9E-04	1.8E-01*	0.0E+00	0.0E+00
PPDDT	5.7E+00	1.1E+08	5.4E+03	5.7E+00	3.5E-01*	3.7E-04	3.5E-01*	0.0E+00	0.0E+00
DIBROMOCHLOROPROPANE	1.4E+00	9.1E+01	3.4E-02	3.3E-02	2.3E-02	9.3E-01*	9.6E-01*	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	1.5E+06	1.9E+01	1.2E-01	4.9E+01*	3.1E-01*	4.9E+01*	0.0E+00	0.0E+00
ENDRIN	2.5E+02	1.0E+06	1.0E+06	2.5E+02	2.4E-02	3.9E-04*	2.4E-02	0.0E+00	0.0E+00
ISODRIN	5.9E+01	2.9E+07	3.0E+03	5.8E+01	1.2E-01*	2.3E-03	1.2E-01*	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	4.1E+01	5.0E+04	2.0E+03	4.0E+01	1.5E-02	3.1E-04	1.5E-02	0.0E+00	0.0E+00
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	2.3E+01*	0.0E+00	2.3E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	7.7E-04	0.0E+00	7.7E-04	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	4.1E-02	0.0E+00	4.1E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.1E-03	0.0E+00	2.1E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	9.3E-04	0.0E+00	9.3E-04	0.0E+00	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.21 SITE NCSA-7: NORTH BOG (formerly Site 24-7: North Bog; EBASCO, 1988b/RIC 88076R05; and EBASCO, 1988c/RIC 88076R05A)

2.21.1 Site-Specific Considerations

Figure NCSA-7-1 and Tables NCSA-7-1 and NCSA-7-2 depict the target contaminants for Site NCSA-7. Borings 1 through 15 from the North Bog were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-7 (EBASCO, 1988b/RIC 88076R05).

2.21.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-7 are shown in Figure NCSA-7-1. Table NCSA-7-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. The concentrations listed for PPDDE, Dieldrin, dimethylmethyl phosphonate, and Endrin represent soil samples taken from outside of the bog, and those for lead and zinc represent sediment samples taken from within the bog (see Figure NCSA-7-1). No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-7-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.21.3 Site Exposure Summary

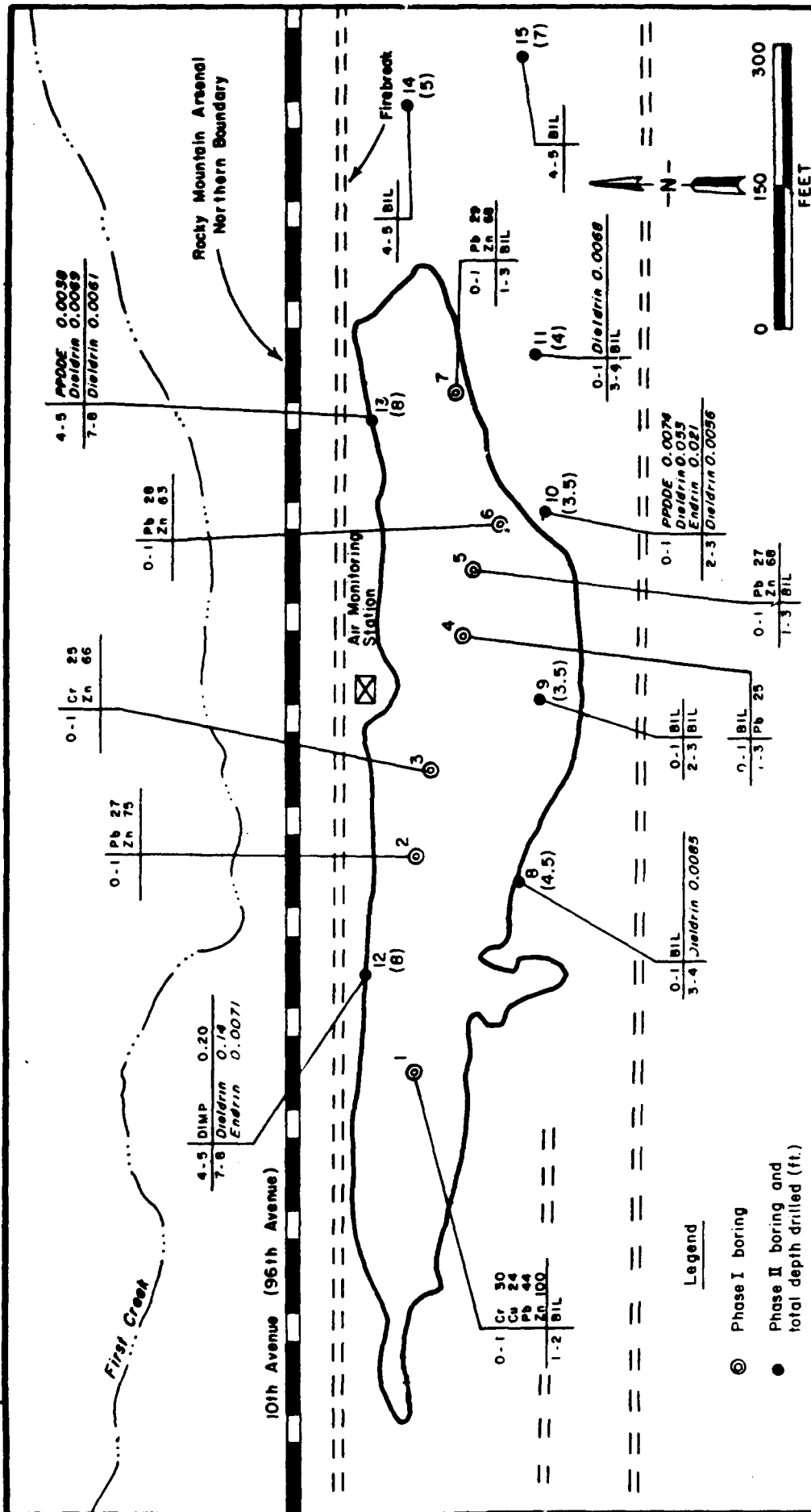
Tables NCSA-7-3 through NCSA-7-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-7 is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	--	--	Direct	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-7 is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:

Program Manager's Office for

Rocky Mountain Arsenal Cleanup

Aberdeen Proving Ground, Maryland

FIGURE NCSA-7-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated

TABLE NCSA-7-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-7

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
PPDDE ^{1/}	0.0074	0-1	10	0.0074	0-1	10
Dieldrin	0.14	7-8	12	0.14	7-8	12
Dimethylmethyl phosphonate	0.20	4-5	12	0.20	4-5	12
Endrin	0.021	0-1	10	0.021	0-1	10
Lead	44	0-1	1	--	--	--
Zinc	100	0-1	1	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-7-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-7

AVERAGE SITE DEPTH TO GROUNDWATER: 18 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	1.8	24163	12/10/87
METHYLENE CHLORIDE	2.7	24163	09/18/87
CHLOROFORM	3.8	24163	09/18/87
CHLOROBENZENE	120	24163	01/12/89
DIBROMOCHLOROPROPANE	0.52	24163	01/12/89
DIISOPROPYLMETHYL PHOSPHONATE	1.3	24163	01/12/89
TETRACHLOROETHYLENE	2.1	24163	01/12/89
TRICHLOROETHYLENE	3.4	24163	01/12/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-7-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.2E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-07
PPDE	7.4E+01	2.5E+07	7.4E+01	1.0E-04	3.0E-10	1.0E-04	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-07
DIELDRIN	1.6E+00	1.9E+05	1.6E+00	8.9E-02	7.5E-07	8.9E-02	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	2.1E-11
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	1.3E-06	0.0E+00	1.3E-06	0.0E+00
ENDRIN	2.5E+03	1.5E+08	2.5E+03	8.5E-06	1.4E-10	8.5E-06	0.0E+00
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	3.7E-07
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	7.5E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.1E-06
LEAD	1.5E+04	0.0E+00	1.5E+04	2.8E-03	0.0E+00	2.8E-03	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-7-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.2E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-07
PPDE	7.4E+01	2.5E+07	7.4E+01	1.0E-04	3.0E-10	1.0E-04	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-07
DIELDRIN	1.6E+00	1.9E+05	1.6E+00	8.9E-02	7.5E-07	8.9E-02	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	2.1E-11
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	1.3E-06	0.0E+00	1.3E-06	0.0E+00
ENDRIN	2.5E+03	1.5E+08	2.5E+03	8.5E-06	1.4E-10	8.5E-06	0.0E+00
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	3.7E-07
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	7.5E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	2.1E-06
LEAD	1.5E+04	0.0E+00	1.5E+04	2.8E-03	0.0E+00	2.8E-03	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-7-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI OPN
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-06
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	6.0E-06
PPDE	1.0E+01	1.6E+06	1.0E+01	7.3E-04	4.5E-09	7.3E-04	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-05
DIELDRIN	2.2E-01	1.2E+04	2.2E-01	6.4E-01*	1.1E-05	6.4E-01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-10
DIMETHYMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	3.2E-06	0.0E+00	3.2E-06	0.0E+00
ENDRIN	1.1E+03	2.3E+07	1.1E+03	2.0E-05	9.0E-10	2.0E-05	0.0E+00
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	5.6E-06
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	9.9E-06
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	4.8E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-05
LEAD	9.2E+03	0.0E+00	9.2E+03	4.8E-03	0.0E+00	4.8E-03	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	9.5E-05	0.0E+00	9.5E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-7-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	LS
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	LS
PPDDE	9.3E+01	1.9E+01	1.6E+01	8.0E-05	3.8E-04	4.6E-04	LS
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	LS
DIELDIN	2.0E+00	5.8E+01	1.9E+00	7.0E-02	2.4E-03	7.3E-02	LS
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	LS
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	2.4E-06	0.0E+00	2.4E-06	LS
ENDRIN	1.4E+03	1.6E+04	1.3E+03	1.5E-05	1.4E-06	1.7E-05	LS
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	LS
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	LS
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	LS
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	LS
LEAD	6.5E+03	0.0E+00	6.5E+03	6.7E-03	0.0E+00	6.7E-03	LS
ZINC	7.8E+05	0.0E+00	7.8E+05	1.3E-04	0.0E+00	1.3E-04	LS

NCSA-7-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-06	LS
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	3.0E-06	LS
PPDE	5.7E+00	3.3E+06	1.9E+01	4.4E+00	1.3E-03	3.8E-04	1.7E-03	0.0E+00	LS
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	5.6E-06	LS
DIELDRIN	1.2E-01	2.5E+04	1.9E+01	1.2E-01	1.1E+00*	7.3E-03	1.2E+00*	0.0E+00	LS
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-10	LS
DIMETHYMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	1.3E-05	0.0E+00	1.3E-05	0.0E+00	LS
ENDRIN	2.5E+02	2.0E+07	1.6E+04	2.5E+02	8.3E-05	1.4E-06	8.4E-05	0.0E+00	LS
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-06	LS
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	4.9E-06	LS
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-09	LS
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-05	LS
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	2.0E-02	0.0E+00	2.0E-02	0.0E+00	LS
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	7.2E-04	0.0E+00	7.2E-04	0.0E+00	LS

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.22 SITE NCSA-8a: SANITARY SEWER LINES (formerly Sites 24-5, 25-2, 26-8, and 35-1 and Sanitary Sewer Interceptor Line and Sanitary Sewer-Railyard and Administrative Areas; EBASCO, 1988d/RIC 88126R06; and EBASCO, 1988e/RIC 88256R03)

2.22.1 Site-Specific Considerations

Figure NCSA-8a-1 and Table NCSA-8a-1 depict the target contaminants for Site NCSA-8a. MKE-Trench 12 Borings 1 through 3, Trench SS01 Borings 1 through 12, Trench SS01 Borings 1 through 8, and Borings B392, 11, 39, 40, 50, 64, and 65 were included in the exposure assessment consistent with the North Central SAR. Since this site is a sewer line, some of the chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-8a (EBASCO, 1988d/RIC 88126R06).

2.22.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-8a were shown in Figures NCSA-8a-1 and NCSA-8a-2. Table NCSA-8a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Methylene chloride, shown in Table 8a-1, is excluded from consideration in the exposure analysis for this site because it was considered a laboratory contaminant in the samples analyzed. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No groundwater data table was included for Site NCSA-8a since this site is a sewer line (see Volume VI-A).

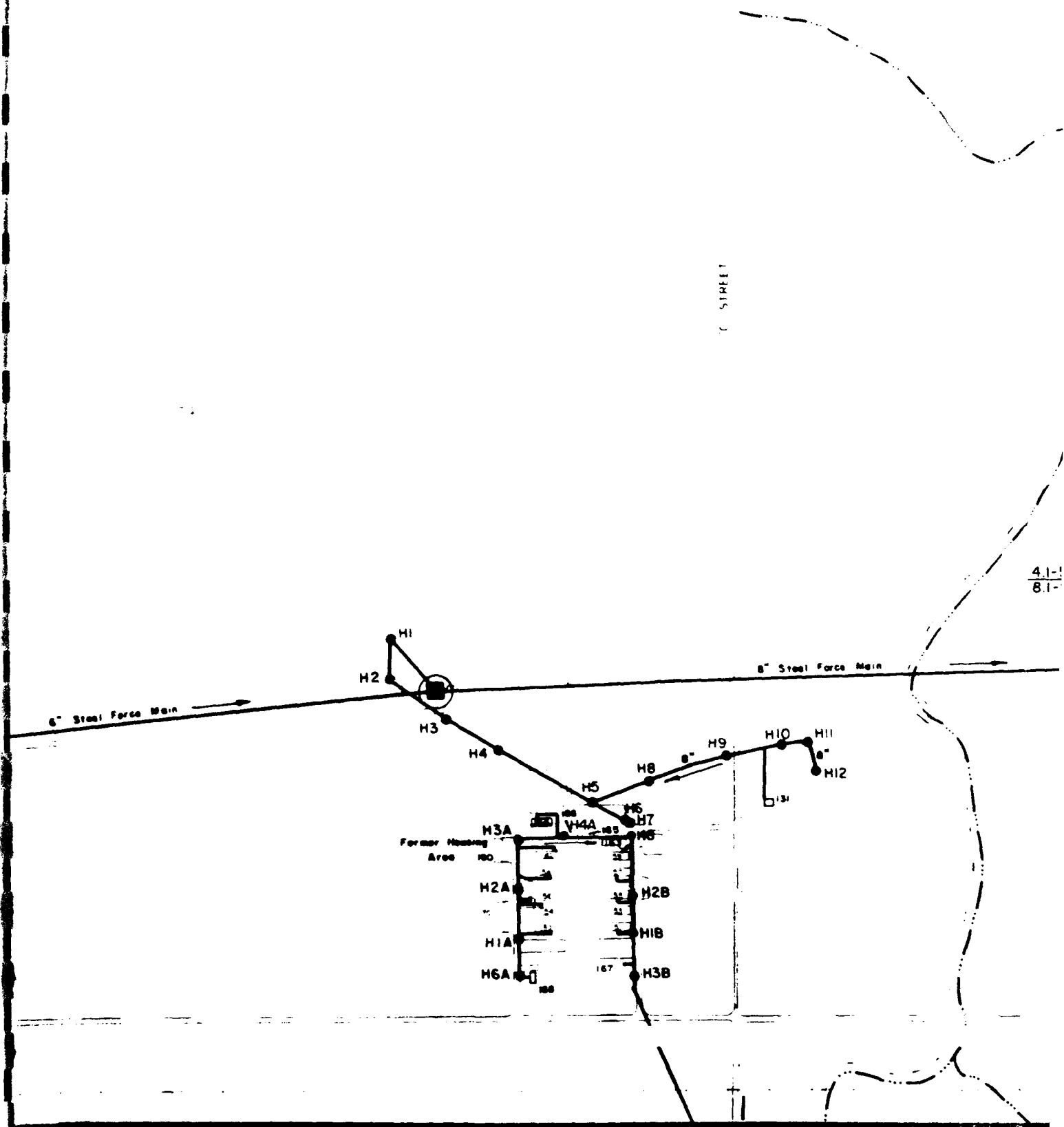
2.22.3 Site Exposure Summary

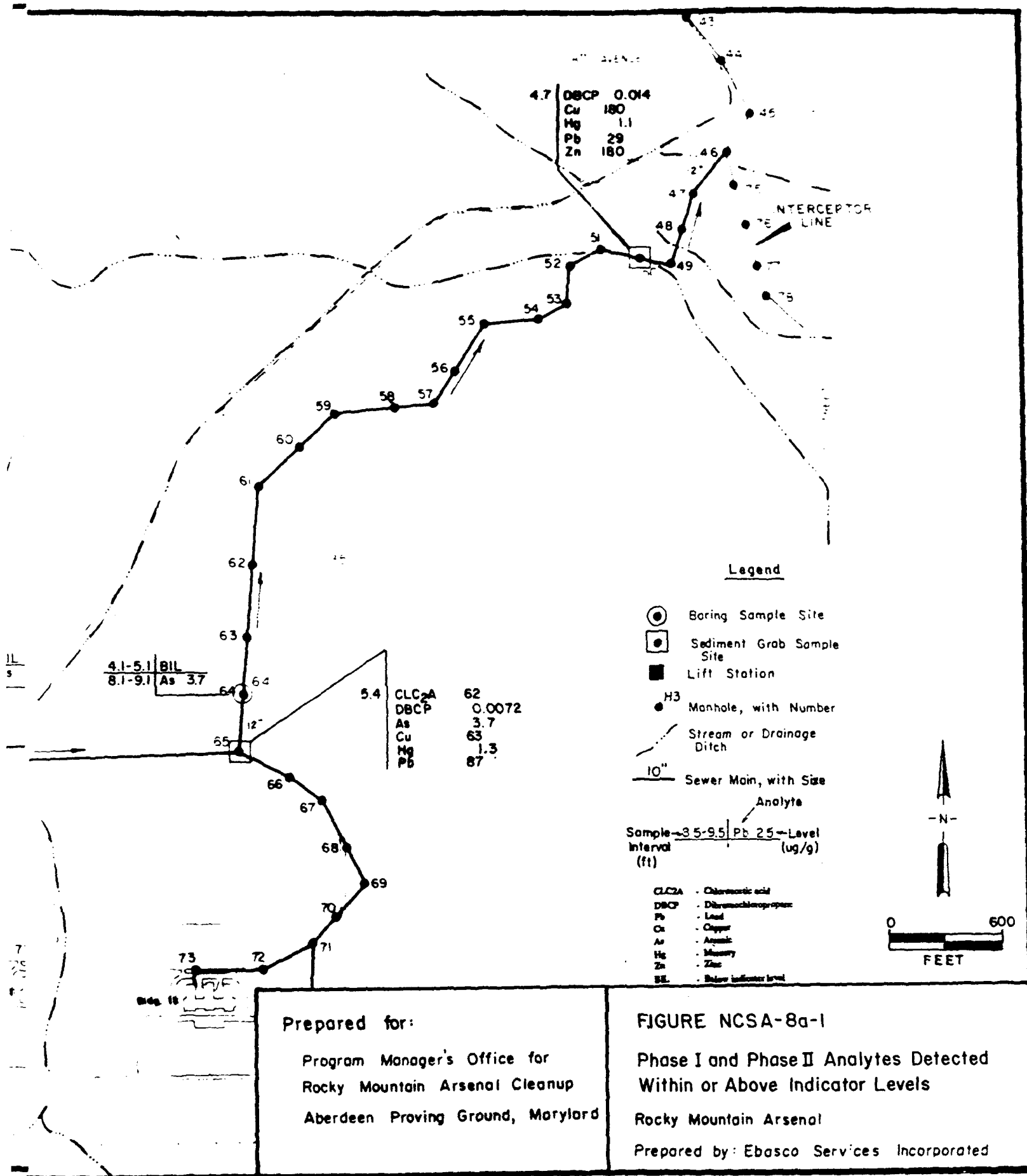
Tables NCSA-8a-2 through NCSA-8a-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Chromium	Direct	Direct	Direct	Direct	Direct
Chloroform	--	--	--	Indirect	Indirect

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-8a is designated as a Priority 1 site based on the most sensitive exposed population PPLV (i.e., the industrial worker).





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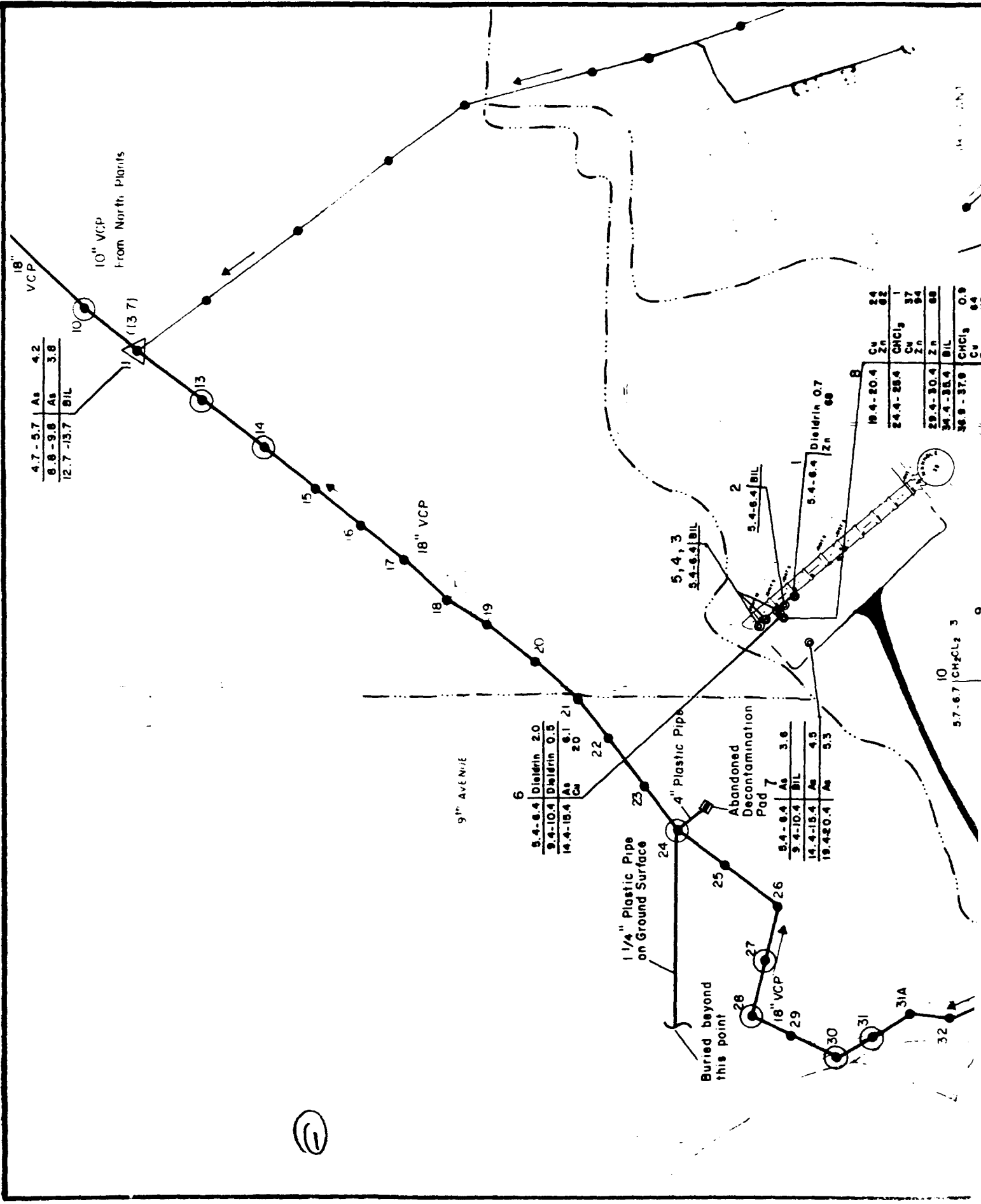
Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

FIGURE NCSA-8a-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated



4.7 - 5.7	As	4.2
6.8 - 9.8	As	3.8
12.7 - 13.7	BIL	

5.4-6.4	Dieldrin	2.0
9.4-10.4	Dieldrin	0.5
14.4-15.4	As	6.1
	Cu	20
	Zn	21

5.4-6.4	As	3.6
9.4-10.4	BIL	
14.4-15.4	As	4.5
19.4-20.4	As	5.3

19.4-20.4	Cu	24
24.4-25.4	CHCl ₃	1
	Cu	37
	Zn	54
29.4-30.4	Zn	68
34.4-35.4	BIL	
36.6-37.6	CHCl ₃	0.9
	Cu	64

5.7-6.7 CH₂Cl₂ 3

9.6-10.6 Cd 16

Cu 27
Zn 120

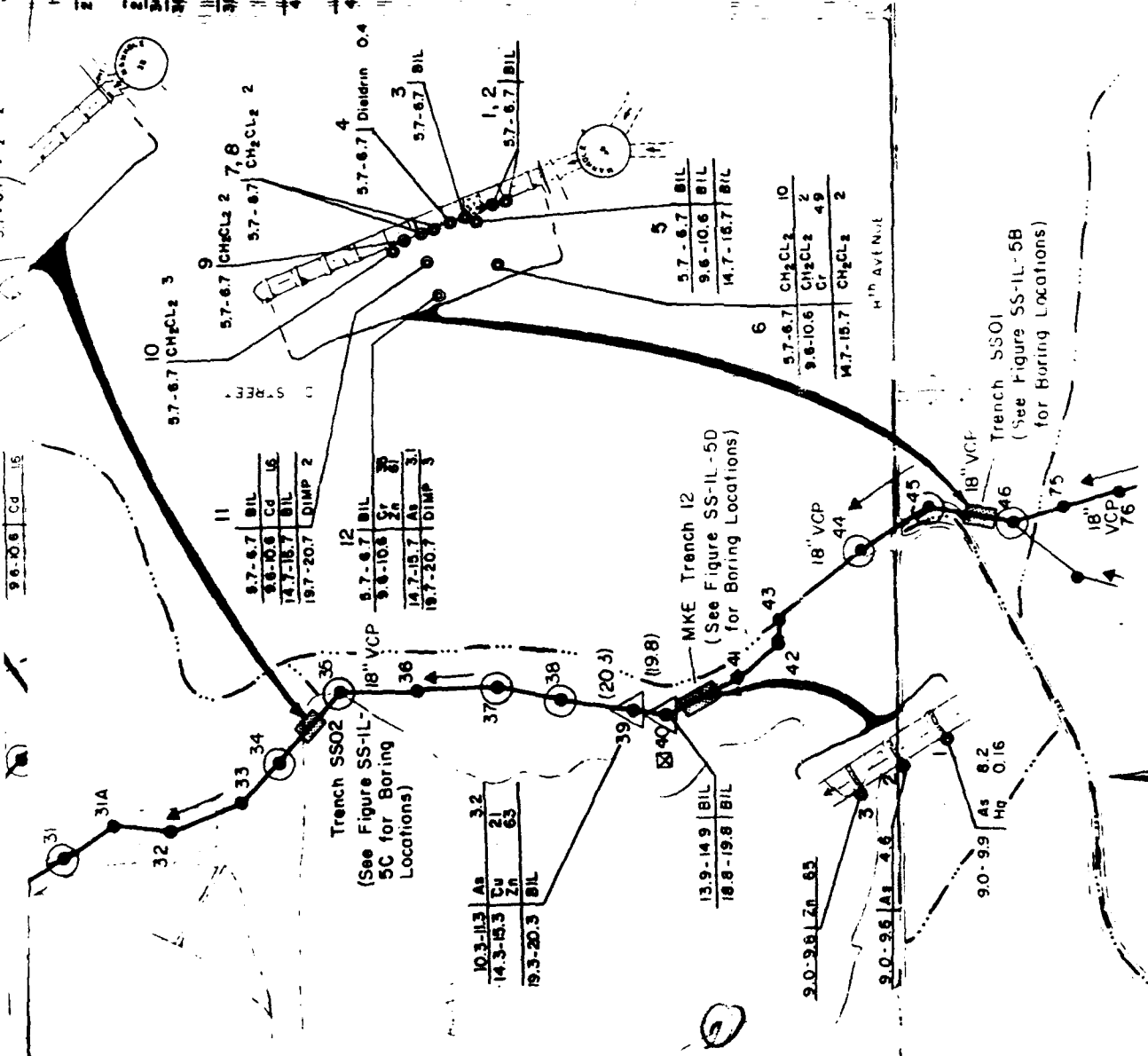
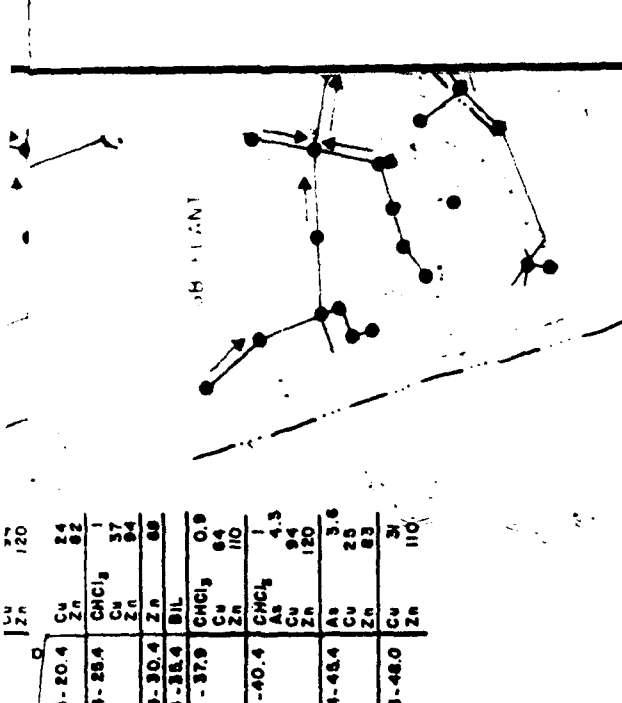


FIGURE NCSA-8a-2
Phase I and Phase II Analytes Detected
Within or Above Indicator Levels
Rocky Mountain Arsenal
Prepared by: Ebasco Services Incorporated

Prepared for:
Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

3

TABLE NCSA-8a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-8a

Contaminant	Horizon 1				Horizon 2			
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)
Chloroacetic acid	62	5.4	65	62	5.4	65		
Chloroform	--	--	--	1	24.4-25.4	SS02-8 ^{1/}		
	--	--	--		39.4-40.4	SS02-84		
Dibromochloropropane				0.014	4.7	50		
Dieldrin	2.0	5.4-6.4	SS02-6+	2.0	5.4-6.4	SS02-6 ^{1/}		
Diisopropylmethyl phosphonate	--	--	--	3	19.7-20.7	SS01-12 ^{1/}		
Methylene chloride ^{2/}	10	5.7-6.7	SS01-6+	10	5.7-6.7	SS01-6 ^{1/}		
Chromium	49	9.6-10.6	SS01-6+	--	--	--		
Copper	180	4.7	50	--	--	--		
Lead	87	5.4	65	--	--	--		
Mercury	1.3	5.4	65	--	--	--		
Zinc	180	4.7	50	--	--	--		

1/ Boring is in Figure NCSA-8a-2.

2/ Suspected laboratory contaminant.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

NCSA-8a-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	3.8E-03	0.0E+00	3.8E-03	0.0E+00
CHLOROFORM	4.0E+03	1.6E+05	3.9E+03	0.0E+00	6.4E-06	6.4E-06	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.3E+03	1.8E+01	7.8E-04	2.2E-06	7.8E-04	0.0E+00
DIELDRIN	1.6E+00	2.3E+06	1.6E+00	1.3E+00*	8.8E-07	1.3E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.8E+08	6.6E+05	0.0E+00	1.6E-08	1.6E-08	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	7.1E-01*	0.0E+00	7.1E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	4.3E-04	0.0E+00	4.3E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.6E-03	0.0E+00	5.6E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.1E-05	0.0E+00	9.1E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8a-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	3.8E-03	0.0E+00	3.8E-03	0.0E+00
CHLOROFORM	4.0E+03	1.6E+05	3.9E+03	0.0E+00	6.4E-06	6.4E-06	0.0E+00
DIBROMOCHLOROPROPANE	1.8E+01	6.3E+03	1.8E+01	7.8E-04	2.2E-06	7.8E-04	0.0E+00
DIELDRIN	1.6E+00	2.3E+06	1.6E+00	1.3E+00*	8.8E-07	1.3E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.8E+08	6.6E+05	0.0E+00	1.6E-08	1.6E-08	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	7.1E-01*	0.0E+00	7.1E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	4.3E-04	0.0E+00	4.3E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	5.6E-03	0.0E+00	5.6E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.9E-04	0.0E+00	3.9E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	9.1E-05	0.0E+00	9.1E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8a-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	7.0E+03	0.0E+00	7.0E+03	8.8E-03	0.0E+00	8.8E-03	0.0E+00
CHLOROFORM	5.6E+02	2.4E+04	5.5E+02	0.0E+00	4.1E-05	4.1E-05	0.0E+00
DIBROMOCHLOROPROPANE	2.5E+00	9.7E+02	2.5E+00	5.6E-03	1.4E-05	5.6E-03	0.0E+00
DIELDRIN	2.2E-01	1.5E+05	2.2E-01	9.2E+00*	1.3E-05	9.2E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	6.6E+07	2.8E+05	0.0E+00	4.6E-08	4.6E-08	0.0E+00
CHROMIUM	8.8E+00	0.0E+00	8.8E+00	5.6E+00*	0.0E+00	5.6E+00*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	7.2E-04	0.0E+00	7.2E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	9.4E-03	0.0E+00	9.4E-03	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	6.6E-04	0.0E+00	6.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.7E-04	0.0E+00	1.7E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8a-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CHLOROACETIC ACID	9.2E+03	0.0E+00	9.2E+03	6.8E-03	0.0E+00	6.8E-03	0.0E+00
CHLOROFORM	5.1E+03	3.1E+00	3.1E+00	0.0E+00	3.2E-01*	3.2E-01*	0.0E+00
DIBROMOCHLOROPROPANE	2.3E+01	2.5E-01	2.5E-01	6.1E-04	5.6E-02	5.6E-02	0.0E+00
DIELDRIN	2.0E+00	5.8E+01	1.9E+00	1.0E+00*	3.5E-02	1.0E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	2.5E+02	2.5E+02	0.0E+00	1.2E-02	1.2E-02	0.0E+00
CHROMIUM	5.5E+01	0.0E+00	5.5E+01	8.9E-01*	0.0E+00	8.9E-01*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	1.0E-03	0.0E+00	1.0E-03	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.3E-02	0.0E+00	1.3E-02	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	9.3E-04	0.0E+00	9.3E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	2.3E-04	0.0E+00	2.3E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-8a-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
CHLOROACETIC ACID	1.7E+03	0.0E+00	0.0E+00	1.7E+03	3.7E-02	0.0E+00	3.7E-02	0.0E+00	0.0E+00
CHLOROFORM	3.1E+02	2.1E+04	1.3E+00	1.3E+00	0.0E+00	7.6E-01*	7.6E-01*	0.0E+00	0.0E+00
DIBROMOCHLOROPROPANE	1.4E+00	8.4E+02	2.5E-01	2.1E-01	1.0E-02	5.6E-02	6.6E-02	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	3.0E+05	1.9E+01	1.2E-01	1.6E+01*	1.0E-01*	1.6E+01*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	2.4E+07	1.5E+03	1.5E+03	0.0E+00	2.0E-03	2.0E-03	0.0E+00	0.0E+00
CHROMIUM	1.1E+00	0.0E+00	0.0E+00	1.1E+00	4.3E+01*	0.0E+00	4.3E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	3.2E-03	0.0E+00	3.2E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	4.0E-02	0.0E+00	4.0E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.8E-03	0.0E+00	2.8E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	1.3E-03	0.0E+00	1.3E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.23 SITE NCSA-8b: DOMESTIC SEWAGE TREATMENT PLANT (formerly Site 24-6: Sewage Treatment Plant; EBASCO, 1987/RIC 87216R08; and EBASCO, 1988f/RIC 87216R08A)

2.23.1 Site-Specific Considerations

Figure NCSA-8b-1 and Tables NCSA-8b-1 and NCSA-8b-2 depict the target contaminants for Site NCSA-8b. Borings 1 through 22 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-8b (EBASCO, 1987/RIC 87216R08).

2.23.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-8b are shown in Figure NCSA-8b-1. Table NCSA-8b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury for Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-8b-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.23.3 Site Exposure Summary

Tables NCSA-8b-3 through NCSA-8b-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-8b is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Aldrin	Direct	Direct	Direct	Direct	Direct
Dieldrin	Direct	Direct	Direct	Direct	Dir/Ind
Arsenic	Direct	Direct	Direct	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.
Indirect exposure pathways include open and enclosed space vapor inhalation.

The results of the soil exposure summary indicate that exposure to contamination from the direct and indirect pathways both contribute to the exceedance of the cumulative PPLVs. Site NCSA-8b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminant results in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Carbon tetrachloride (enclosed)

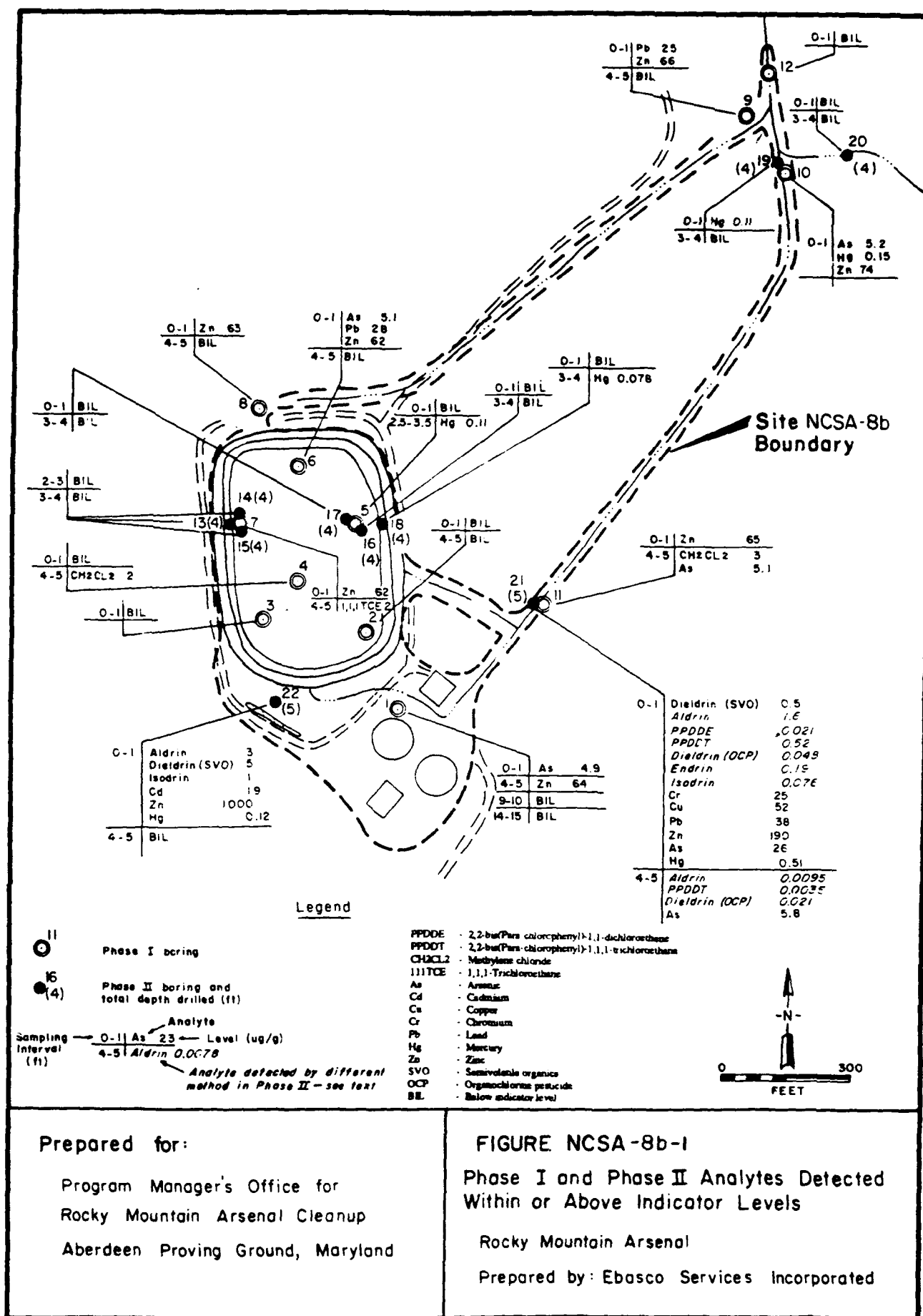


TABLE NCSA-8b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-8b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Aldrin	3	0-1	22	3	0-1	22
PPDDE ^{1/}	0.021	0-1	21	0.021	0-1	21
PPDDT ^{2/}	0.52	0-1	21	0.52	0-1	21
Dieldrin	5	0-1	22	5	0-1	22
Endrin	0.19	0-1	21	0.19	0-1	21
Isodrin	1	0-1	22	1	0-1	22
Methylene chloride	3	4-5	11	3	4-5	11
1,1,1-Trichloroethane	2	4-5	7	2	4-5	7
Arsenic	26	0-1	21	--	--	--
Copper	52	0-1	21	--	--	--
Mercury	0.51	0-1	21	--	--	--
Zinc	1000	0-1	22	--	--	--

1/ PPDDE 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene
2/ PPDDT 2,2-bis(Para-chlorophenyl)-1,1,1-trichloroethane

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-8b-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-8b

AVERAGE SITE DEPTH TO GROUNDWATER: 16 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CARBON TETRACHLORIDE	12	24117	09/22/87
CHLOROFORM	2.6	24199	01/27/88
CHLOROBENZENE	2.2	24199	01/27/88
DIISOPROPYLMETHYL PHOSPHONATE	15	24199	01/27/88
DIELDRIN	0.096	24199	05/18/88
ENDRIN	0.097	24199	01/27/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

NCSA-8b-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	6.5E+04	1.5E+00	2.0E+00*	4.6E-05	2.0E+00*	0.0E+00
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-03
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.4E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-06
PPDE	7.4E+01	3.9E+06	7.4E+01	2.9E-04	5.3E-09	2.9E-04	0.0E+00
PPDT	7.4E+01	8.3E+06	7.4E+01	7.1E-03	6.3E-08	7.1E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.2E+00*	1.7E-04a	3.2E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-09
ENDRIN	2.5E+03	2.4E+07	2.5E+03	7.7E-05	7.9E-09	7.7E-05	2.6E-11
ISODRIN	5.8E+02	4.7E+06	5.8E+02	1.7E-03	2.1E-07	1.7E-03	0.0E+00
METHYLENE CHLORIDE	3.3E+03	3.5E+03	1.7E+03	9.2E-04	8.5E-04	1.8E-03	0.0E+00
1,1,1-TRICHLOROETHANE	7.5E+05	6.4E+06	6.7E+05	2.7E-06	3.1E-07	3.0E-06	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.2E+00*	0.0E+00	1.2E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.2E-04	0.0E+00	1.2E-04	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.5E-04	0.0E+00	1.5E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-04	0.0E+00	5.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPLV for this contaminant is considered to be equal to pure compound. The SPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8b-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	6.5E+04	1.5E+00	2.0E+00*	4.6E-05	2.0E+00*	0.0E+00
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-03
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.4E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-06
PPDE	7.4E+01	3.9E+06	7.4E+01	2.9E-04	5.3E-09	2.9E-04	0.0E+00
PPDT	7.4E+01	8.3E+06	7.4E+01	7.1E-03	6.3E-08	7.1E-03	0.0E+00
DIELDRIN	1.6E+00	1.0E+06	1.6E+00	3.2E+00*	1.7E-04 ^a	3.2E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-09
ENDRIN	2.5E+03	2.4E+07	2.5E+03	7.7E-05	7.9E-09	7.7E-05	2.6E-11
ISODRIN	5.8E+02	4.7E+06	5.8E+02	1.7E-03	2.1E-07	1.7E-03	0.0E+00
METHYLENE CHLORIDE	3.3E+03	3.5E+03	1.7E+03	9.2E-04	8.5E-04	1.8E-03	0.0E+00
1,1,1-TRICHLOROETHANE	7.5E+05	6.4E+06	6.7E+05	2.7E-06	3.1E-07	3.0E-06	0.0E+00
ARSENIC	2.2E+01	0.0E+00	2.2E+01	1.2E+00*	0.0E+00	1.2E+00*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.2E-04	0.0E+00	1.2E-04	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	1.5E-04	0.0E+00	1.5E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-04	0.0E+00	5.0E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8b-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	4.3E+03	2.1E-01	1.4E+01*	6.5E-04	1.4E+01*	0.0E+00
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-02
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	6.1E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-05
PPDE	1.0E+01	2.6E+05	1.0E+01	2.1E-03	8.0E-08	2.1E-03	0.0E+00
PPDDT	1.0E+01	5.5E+05	1.0E+01	5.1E-02	9.4E-07	5.1E-02	0.0E+00
DIELDRIN	2.2E-01	1.0E+06	2.2E-01	2.3E+01*	2.5E-03a	2.3E+01*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-08
ENDRIN	1.1E+03	3.7E+06	1.1E+03	1.8E-04	5.1E-08	1.8E-04	1.7E-10
ISODRIN	2.5E+02	7.3E+05	2.5E+02	4.1E-03	1.4E-06	4.1E-03	0.0E+00
METHYLENE CHLORIDE	4.5E+02	5.5E+02	2.5E+02	6.6E-03	5.5E-03	1.2E-02	0.0E+00
1,1,1-TRICHLOROETHANE	3.2E+05	2.3E+06	2.8E+05	6.3E-06	8.6E-07	7.1E-06	0.0E+00
ARSENIC	3.9E+00	0.0E+00	3.9E+00	6.6E+00*	0.0E+00	6.6E+00*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	2.1E-04	0.0E+00	2.1E-04	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	2.6E-04	0.0E+00	2.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	9.5E-04	0.0E+00	9.5E-04	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8b-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	1.3E+02	1.9E+00	1.6E+00*	2.4E-02	1.6E+00*	0.0E+00
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.3E+00
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.4E-03
PPDDE	9.3E+01	1.9E+01	1.6E+01	2.3E-04	1.1E-03	1.3E-03	0.0E+00
PPDDT	9.3E+01	1.6E+04	9.2E+01	5.6E-03	3.2E-05	5.6E-03	0.0E+00
DIELDRIN	2.0E+00	1.0E+06	1.9E+00	2.5E+00*	8.7E-02a	2.6E+00*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	6.3E-06
ENDRIN	1.4E+03	2.9E+02	2.4E+02	1.4E-04	6.6E-04	8.0E-04	1.0E-07
ISODRIN	3.2E+02	6.7E+01	5.5E+01	3.1E-03	1.5E-02	1.8E-02	0.0E+00
METHYLENE CHLORIDE	4.1E+03	5.3E+01	5.2E+01	7.3E-04	5.7E-02	5.7E-02	0.0E+00
1,1,1-TRICHLOROETHANE	4.2E+05	3.2E+04	3.0E+04	4.8E-06	6.3E-05	6.7E-05	0.0E+00
ARSENIC	2.0E+01	0.0E+00	2.0E+01	1.3E+00*	0.0E+00	1.3E+00*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	3.0E-04	0.0E+00	3.0E-04	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	3.7E-04	0.0E+00	3.7E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.3E-03	0.0E+00	1.3E-03	0.0E+00

a: This contaminant saturates the soil gas and produces a vapor flux which is below one-tenth of the critical flux. The SPPPLV for this contaminant is considered to be equal to pure compound. The SPPPLV has therefore been set to 1.00E+06 mg/kg (See volume VI-A).

*: EI is equal to or exceeds 1.0E-01

NCSA-8b-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	8.7E+03	4.2E+01	1.2E-01	2.6E+01*	7.2E-02	2.6E+01*	0.0E+00	0.0E+00
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-03	3.8E+00
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	7.0E-07	3.6E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-05	7.2E-03
PPDE	5.7E+00	5.3E+05	1.9E+01	4.4E+00	3.7E-03	1.1E-03	4.7E-03	0.0E+00	0.0E+00
PPDT	5.7E+00	1.1E+06	5.4E+03	5.7E+00	9.1E-02	9.8E-05	9.1E-02	0.0E+00	0.0E+00
DIELDRIN	1.2E-01	4.0E+03	1.9E+01	1.2E-01	4.1E+01*	2.6E-01*	4.1E+01*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-08	6.3E-06
ENDRIN	2.5E+02	3.2E+06	8.6E+02	2.0E+02	7.5E-04	2.2E-04	9.7E-04	2.0E-10	1.0E-07
ISODRIN	5.9E+01	6.3E+05	2.0E+02	4.6E+01	1.7E-02	5.0E-03	2.2E-02	0.0E+00	0.0E+00
METHYLENE CHLORIDE	2.5E+02	4.7E+02	5.3E+01	4.0E+01	1.2E-02	6.3E-02	7.5E-02	0.0E+00	0.0E+00
1,1,1-TRICHLOROETHANE	7.8E+04	8.5E+05	9.6E+04	4.1E+04	2.6E-05	2.3E-05	4.9E-05	0.0E+00	0.0E+00
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	1.6E+01*	0.0E+00	1.6E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	9.1E-04	0.0E+00	9.1E-04	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	1.1E-03	0.0E+00	1.1E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	7.2E-03	0.0E+00	7.2E-03	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.24 SITE NCSA-8c: SECTION 34 - MERCURY DETECTION (formerly Section 34-Nonsource Area; ESE, 1988w/RIC 88203R04)

2.24.1 Site-Specific Considerations

Figure NCSA-8c-1 and Table NCSA-8c-1 depict the target contaminants for Site NCSA-8c. Borings LS0002 and H2 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-8c (ESE, 1988w/RIC 88203R04).

2.24.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-8c are shown in Figure NCSA-8c-1. Table NCSA-8c-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.24.3 Site Exposure Summary

Tables NCSA-8c-2 through NCSA-8c-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Chromium	Direct	Direct	Direct	Direct	Direct
Lead	--	--	--	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-8c is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

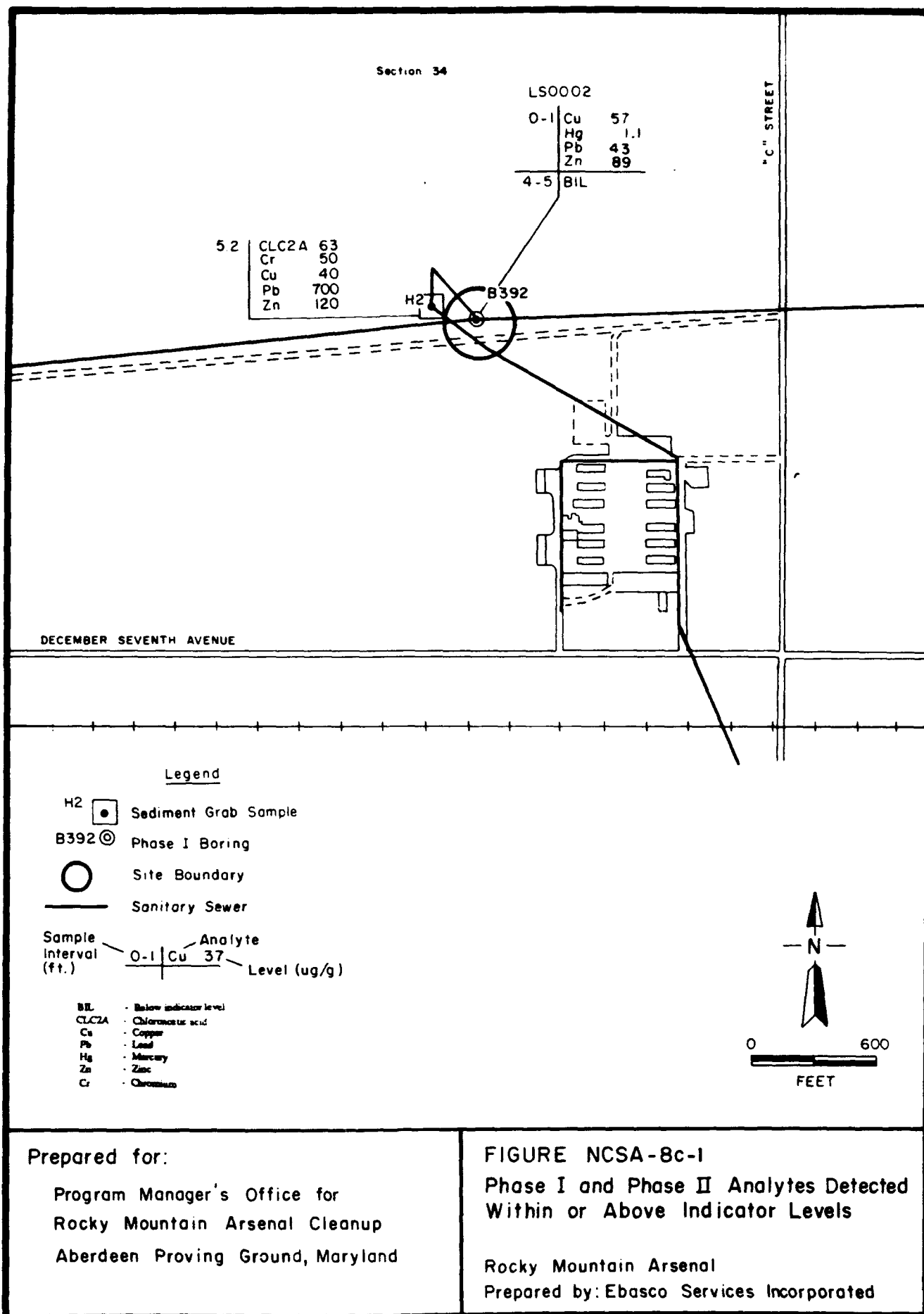


TABLE NCSA-8c-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-8c

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Chloroacetic acid	63	5.2	H2	63	5.2	H2
Chromium	50	5.2	H2	--	--	--
Copper	57	0-1	LS0002	--	--	--
Lead	700	5.2	H2	--	--	--
Mercury	1.1	0-1	LS0002	--	--	--
Zinc	120	5.2	H2	--	--	--
North Central Study Area						
NCSA	Maximum					
Max.	microgram per gram					
ug/g	foot/feet					
ft						

NCSA-8c-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	3.8E-03	0.0E+00	3.8E-03	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	7.2E-01*	0.0E+00	7.2E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.4E-04	0.0E+00	1.4E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	4.5E-02	0.0E+00	4.5E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-04	0.0E+00	3.3E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8c-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	1.7E+04	0.0E+00	1.7E+04	3.8E-03	0.0E+00	3.8E-03	0.0E+00
CHROMIUM	6.9E+01	0.0E+00	6.9E+01	7.2E-01*	0.0E+00	7.2E-01*	0.0E+00
COPPER	4.2E+05	0.0E+00	4.2E+05	1.4E-04	0.0E+00	1.4E-04	0.0E+00
LEAD	1.5E+04	0.0E+00	1.5E+04	4.5E-02	0.0E+00	4.5E-02	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-04	0.0E+00	3.3E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	6.0E-05	0.0E+00	6.0E-05	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8c-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CHLOROACETIC ACID	7.0E+03	0.0E+00	7.0E+03	9.0E-03	0.0E+00	9.0E-03	0.0E+00
CHROMIUM	8.8E+00	0.0E+00	8.8E+00	5.7E+00*	0.0E+00	5.7E+00*	0.0E+00
COPPER	2.5E+05	0.0E+00	2.5E+05	2.3E-04	0.0E+00	2.3E-04	0.0E+00
LEAD	9.2E+03	0.0E+00	9.2E+03	7.6E-02	0.0E+00	7.6E-02	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	5.6E-04	0.0E+00	5.6E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	1.1E-04	0.0E+00	1.1E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-8c-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CHLOROACETIC ACID	9.2E+03	0.0E+00	9.2E+03	6.9E-03	0.0E+00	6.9E-03	0.0E+00
CHROMIUM	5.5E+01	0.0E+00	5.5E+01	9.1E-01*	0.0E+00	9.1E-01*	0.0E+00
COPPER	1.8E+05	0.0E+00	1.8E+05	3.2E-04	0.0E+00	3.2E-04	0.0E+00
LEAD	6.5E+03	0.0E+00	6.5E+03	1.1E-01*	0.0E+00	1.1E-01*	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	7.9E-04	0.0E+00	7.9E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.5E-04	0.0E+00	1.5E-04	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-8c-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
CHLOROACETIC ACID	1.7E+03	0.0E+00	0.0E+00	1.7E+03	3.7E-02	0.0E+00	3.7E-02	0.0E+00	0.0E+00
CHROMIUM	1.1E+00	0.0E+00	0.0E+00	1.1E+00	4.4E+01*	0.0E+00	4.4E+01*	0.0E+00	0.0E+00
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	1.0E-03	0.0E+00	1.0E-03	0.0E+00	0.0E+00
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	3.2E-01*	0.0E+00	3.2E-01*	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.4E-03	0.0E+00	2.4E-03	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	8.6E-04	0.0E+00	8.6E-04	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.25 SITE NCSA-9a: SECTION 23 - DIISOPROPYLMETHYL PHOSPHONATE
DETECTION (formerly Section 23-Nonsource Area; ESE, 1988p/RIC 88243R02)

2.25.1 Site-Specific Considerations

Figure NCSA-9a-1 and Tables NCSA-9a-1 and NCSA-9a-2 depict the target contaminants for Site NCSA-9a. Borings 5078 and 001 through 003 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9a (ESE, 1988p/RIC 88243R02).

2.25.2. Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9a are shown in Figure NCSA-9a-1. Table NCSA-9a-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury because direct soil exposure below 10 ft. is assumed to be negligible (see Volume VI-A). Table NCSA-9a-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.25.3 Site Exposure Summary

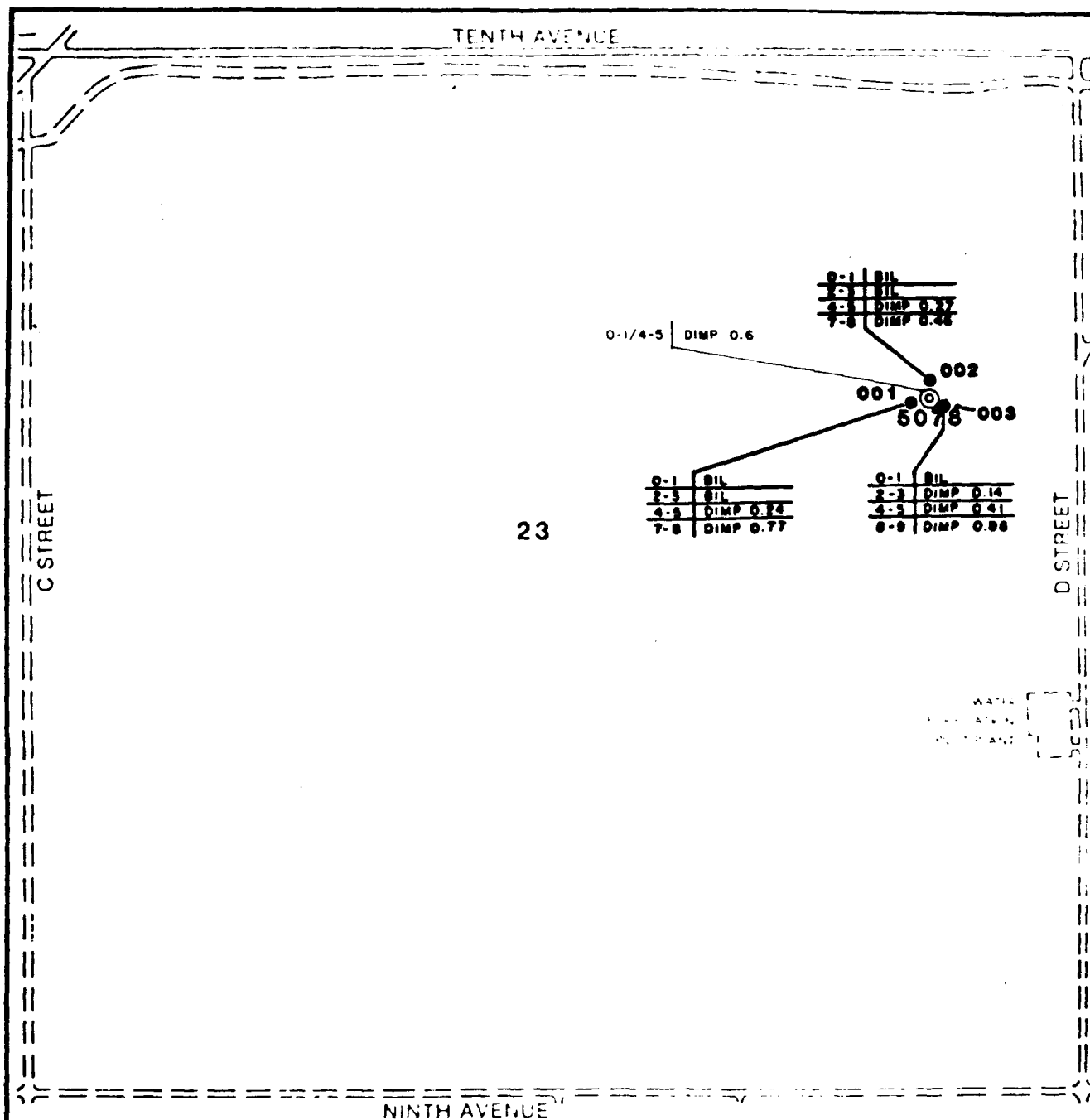
Tables NCSA-9a-3 through NCSA-9a-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9a is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9a is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

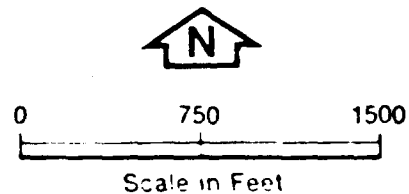
The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Dicyclopentadiene (enclosed)
- Chloroform (enclosed)



Legend

(○) Phase I Boring (●) Phase II Boring
 Composite Sample Analyte
 0-1/4-5 Pb 27 ← Level up 0
 Zn 66
 DIMP - Diisopropylmethyl phosphonate
 BIL - Below indicator level



Prepared for:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland
 SOURCE ESE 1987

FIGURE NCSA-9a-1
 Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels
 Rocky Mountain Arsenal
 Prepared by Ebasco Services Incorporated

TABLE NCSA-9a-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9a

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Diisopropylmethyl phosphonate	0.86	8-9	003	0.86	8-9	003

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9a-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9a
AVERAGE SITE DEPTH TO GROUNDWATER: 21 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1-DICHLOROETHANE	0.86	23231	12/7/88
1,2-DICHLOROETHYLENE	6.5	23160	09/17/87
1,2-DICHLOROETHANE	14	23119	01/8/88
ALDRIN	3.4	23231	12/7/88
ATRAZINE	60	23231	12/7/88
BICYCLOHEPTADIENE	46	23231	12/7/88
BENZENE	9.7	23119	01/8/88
METHYLENE CHLORIDE	12	23119	01/8/88
CHLOROFORM	3100	23119	01/8/88
HEXACHLOROCYCLOPENTADIENE	2.0	23231	05/16/88
CHLOROBENZENE	3.3	23232	01/27/88
CHLORDANE	11	23231	12/7/88
CHLOROPHENYLMETHYL SULFIDE	41	23119	01/8/88
CHLOROPHENYLMETHYL SULFOXIDE	20	23231	05/16/88
CHLOROPHENYLMETHYL SULFONE	150	23160	09/17/87
DIBROMOCHLOROPROPANE	0.28	23119	01/8/88
DICYCLOPENTADIENE	940	23231	12/7/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9a-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9a

AVERAGE SITE DEPTH TO GROUNDWATER: 21 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
DIISOPROPYLMETHYL PHOSPHONATE	5000	23119	01/8/88
DITHIANE	67	23231	05/16/88
DIELDRIN	4.8	23231	12/7/88
DIMETHYLMETHYL PHOSPHONATE	28	23231	12/7/88
ENDRIN	GT 10	23231	12/7/88
ETHYLBENZENE	1.5	23160	09/17/87
TOLUENE	9.0	23231	12/7/88
MALATHION	2.7	23231	12/7/88
1,4-OXATHIANE	18	23119	01/8/88
PPDDE	0.17	23231	05/16/88
PPDDT	0.75	23231	12/7/88
PARATHION	2.2	23231	12/7/88
SUPONA	1.4	23231	12/7/88
TETRACHLOROETHYLENE	87	23231	05/16/88
TRICHLOROETHYLENE	11	23231	01/26/88
O,P-XYLENE	3.0	23231	05/16/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

MCSA-9a-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-06
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-07
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-04
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-10
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-09
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-07
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-06
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-03
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	7.7E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.3E+06	4.4E+05	1.3E-06	6.4E-07	1.9E-06	8.0E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-10
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	7.3E-10
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-05
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	8.6E-14
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-06
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-12
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-05
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	9.6E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	6.9E-06
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.0E-09

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9a-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-06
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	2.6E-07
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.2E-04
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-08
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-10
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-09
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-07
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-07
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-10
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-06
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-03
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	7.7E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	1.3E+06	4.4E+05	1.3E-06	6.4E-07	1.9E-06	8.0E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-10
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	7.3E-10
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-05
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	8.6E-14
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-06
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.6E-12
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-05
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	9.6E-10
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	6.9E-06
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.0E-09

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9a-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	2.9E-05
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	9.2E-13
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-06
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-06
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-03
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-08
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-09
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	7.1E-10
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-07
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	4.4E-06
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-06
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	2.5E-09
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	8.0E-05
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-02
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	1.2E-06
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	9.1E+05	2.1E+05	3.1E-06	9.5E-07	4.0E-06	5.2E-07
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.5E-09
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	4.7E-09
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	7.8E-05
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	5.6E-13
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-05
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-11
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-13
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-04
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	6.2E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-04
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-08

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9a-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	3.4E-02
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-03
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.6E+00
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	6.6E-06
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-06
PPDDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	4.6E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-03
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-03
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	8.3E-07
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-02
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.1E+01
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-04
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	1.6E+02	1.6E+02	2.3E-06	5.3E-03	5.3E-03	1.2E-03
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	5.9E-06
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-05
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	1.8E-01
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-09
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	8.5E-03
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	1.5E-05
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-02
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	3.0E-05

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EI
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	1.5E-05	3.0E-
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-12	2.2E-
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-05	1.0E-
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-06	3.9E-
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-06	4.4E-
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-07	3.0E-
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-03	4.9E-
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.5E-08	1.5E-
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-09	6.6E-
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	8.2E-10	1.7E-
PPDDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	6.8E-08	1.4E-
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-06	4.4E-
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-06	6.2E-
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-09	2.5E-
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	4.0E-05	8.1E-
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E-
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-02	3.1E-
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	5.8E-07	1.2E-
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	1.8E+05	1.6E+02	1.6E+02	1.3E-05	5.3E-03	5.3E-03	6.0E-07	1.2E-
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E-
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E-
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-09	5.9E-
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-09	1.1E-
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	9.0E-05	1.8E-
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-13	1.3E-
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-05	2.6E-
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E-
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-11	2.5E-
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-13	5.3E-
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-04	4.2E-
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	7.2E-09	1.5E-
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	5.1E-05	1.0E-
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-08	3.0E-

2.26 SITE NCSA-9b: SECTION 23 - CADMIUM DETECTION (formerly Section 23-Nonsource Area; ESE, 1988p/RIC 88243R02)

2.26.1 Site-Specific Considerations

Figure NCSA-9b-1 and Table NCSA-9b-1 depict the target contaminants for Site NCSA-9b. Boring 5081 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9b (ESE, 1988p/RIC 88243R02).

2.26.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9b are shown in Figure NCSA-9b-1. Table NCSA-9b-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.26.3 Site Exposure Summary

Tables NCSA-9b-2 through NCSA-9b-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-9b is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

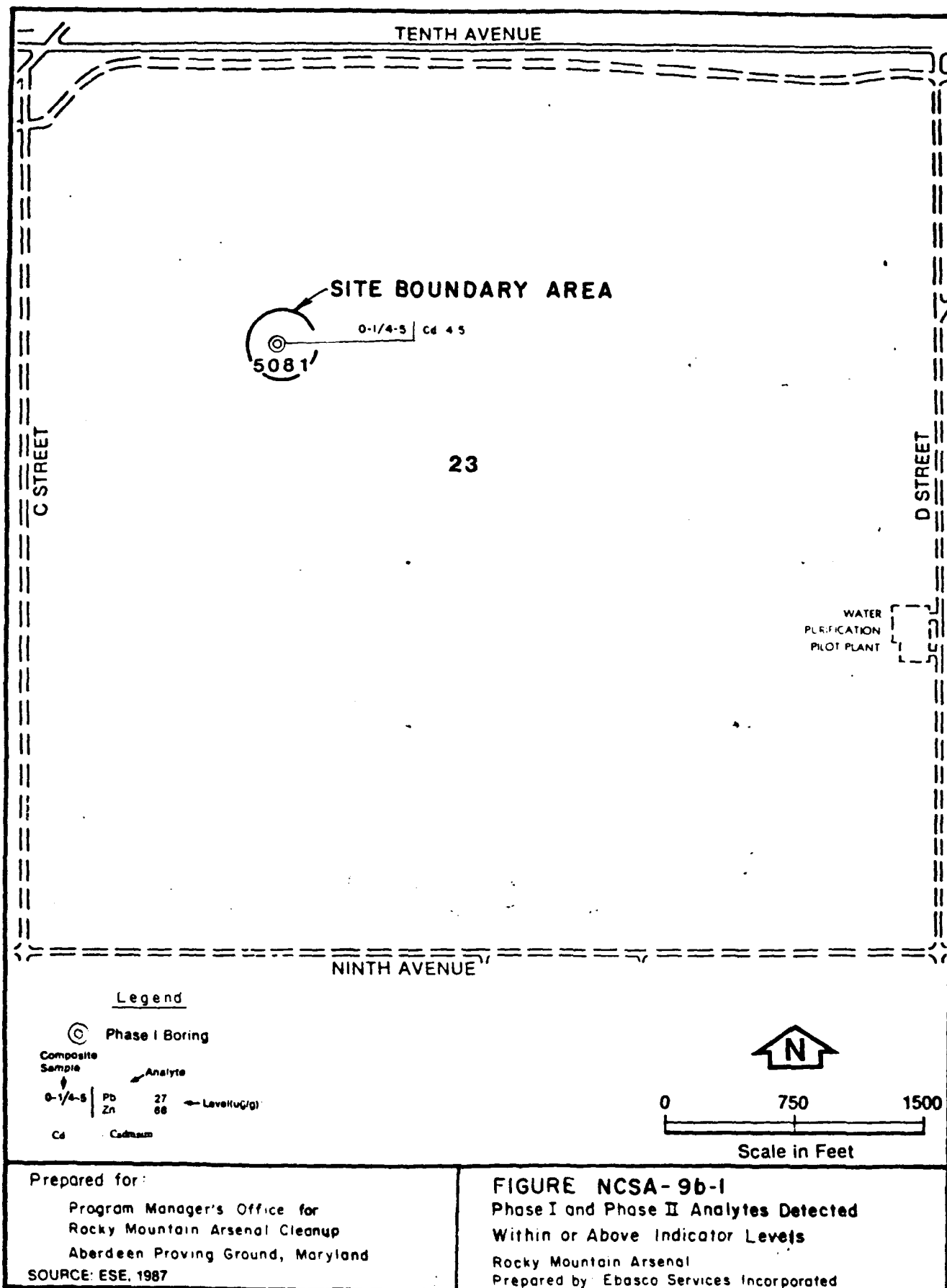


TABLE NCSA-9b-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9b

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Cadmium	4.5	Comp ^{1/} 0-1, 4-5	5081	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

NCSA-9b-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.0E-02	0.0E+00	1.0E-02	0.0E+00

NCSA-9b-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.0E-02	0.0E+00	1.0E-02	0.0E+00

NCSA-9b-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
CADMIUM	5.8E+01	0.0E+00	5.8E+01	7.8E-02	0.0E+00	7.8E-02	0.0E+00

NCSA-9b-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CADMIUM	3.6E+02	0.0E+00	3.6E+02	1.3E-02	0.0E+00	1.3E-02	0.0E+00

HCSA-9b-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EI
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	5.9E-01*	0.0E+00	5.9E-01*	0.0E+00	0.0E+

*: EI is equal to or exceeds 1.0E-01

2.27 SITE NCSA-9c: SECTION 23 - CADMIUM DETECTION (formerly Section 23-Nonsource Area; ESE, 1988p/RIC 88243R02)

2.27.1 Site-Specific Considerations

Figure NCSA-9c-1 and Table NCSA-9c-1 depict the target contaminants for Site NCSA-9c. Boring 5073 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9c (ESE, 1988p/RIC 88243R02).

2.27.2 Spatial Distribution of Measured Contaminant Concentrations

The location and concentration of the target contaminants that were detected in Site NCSA-9c are shown in Figure NCSA-9c-1. Table NCSA-9c-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP, metals, arsenic and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

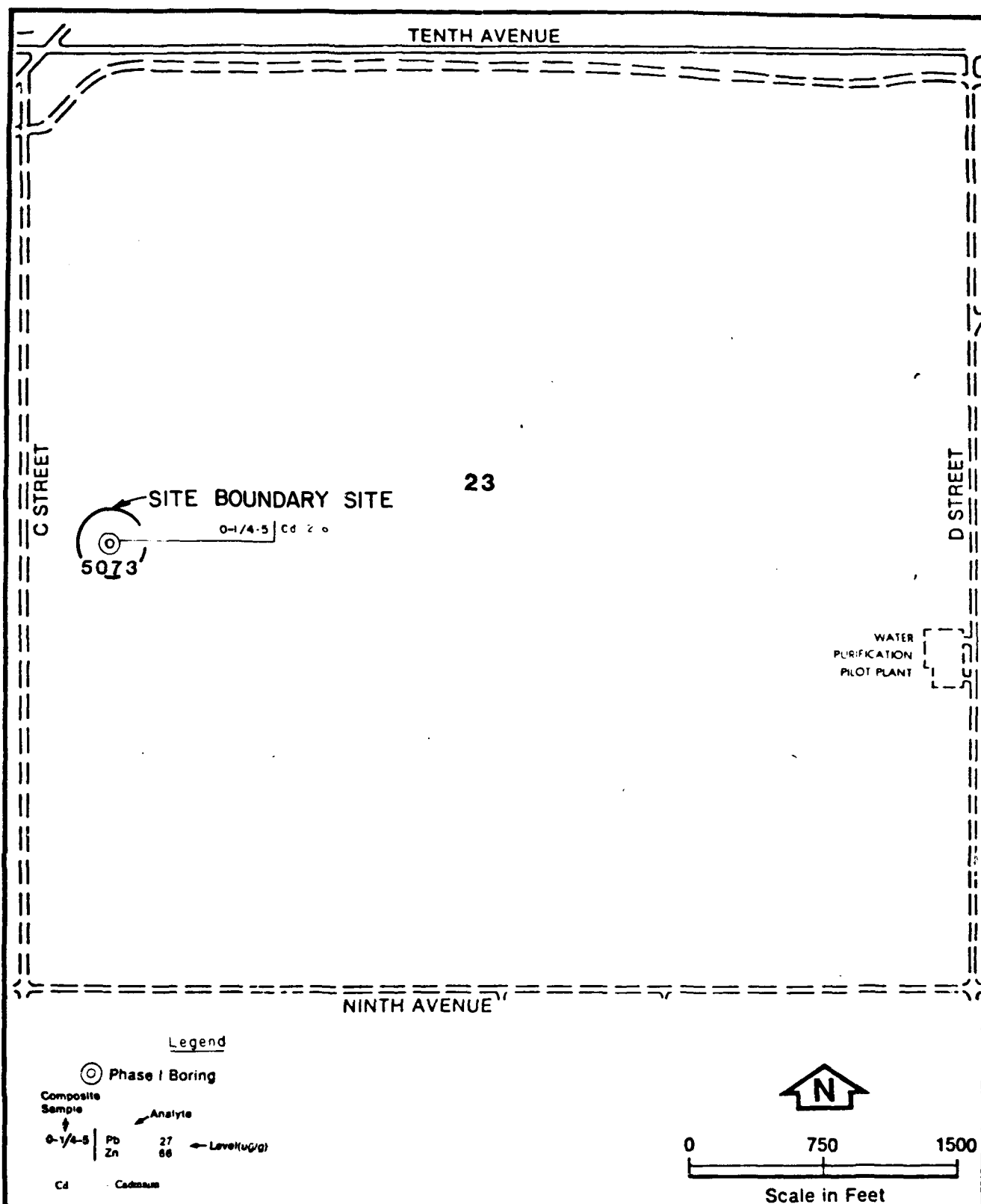
2.27.3 Site Exposure Summary

Tables NCSA-9c-2 through NCSA-9c-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs for an industrial worker. Site NCSA-9c is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

SOURCE: ESE, 1987

FIGURE NCSA-9c-1
Phase I and Phase II Analytes Detected
Within or Above Indicator Levels
Rocky Mountain Arsenal
Prepared by Ebasco Services Incorporated

TABLE NCSA-9c-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9c

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Cadmium	2.8	Comp ^{1/} 0-1, 4-5	5073	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/foot

NCSA-9c-2

EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.2E-03	0.0E+00	6.2E-03	0.0E+00

NCSA-9c-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.2E-03	0.0E+00	6.2E-03	0.0E+00

NCSA-9c-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
CADMIUM	5.8E+01	0.0E+00	5.8E+01	4.8E-02	0.0E+00	4.8E-02	0.0E+00

NCSA-9c-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
CADMIUM	3.6E+02	0.0E+00	3.6E+02	7.8E-03	0.0E+00	7.8E-03	0.0E+00

NCSA-9c-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EN
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	3.7E-01*	0.0E+00	3.7E-01*	0.0E+00	0.0E+

*: EI is equal to or exceeds 1.0E-01

2.28 SITE NCSA-9d: SECTION 23 - CADMIUM DETECTION (formerly Section 23-Nonsource Area, ESE, 1988p/RIC 88243R02)

2.28.1 Site-Specific Considerations

Figure NCSA-9d-1 and Tables NCSA-9d-1 and NCSA-9d-2 depict the target contaminants for Site NCSA-9d. Boring 5063 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9d (ESE, 1988p/RIC 88243R02).

2.28.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9d are shown in Figure NCSA-9d-1. Table NCSA-9d-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9d-2 summarizes the maximum concentrations detected in groundwater together with the boring number, location, sampling interval, and depth to groundwater.

2.28.3 Site Exposure Summary

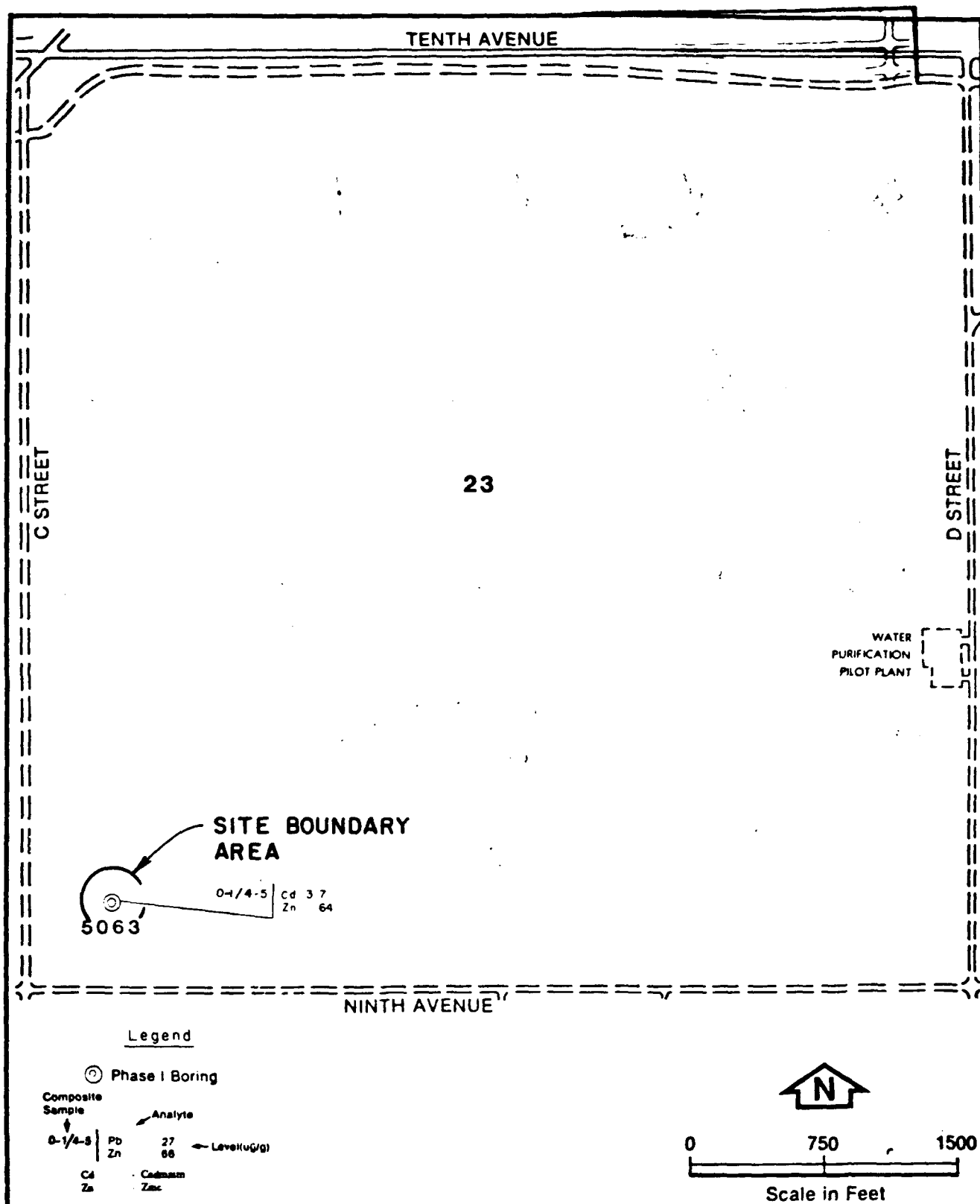
Tables NCSA-9d-3 through NCSA-9d-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9d is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-9d is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland
 SOURCE: ESE, 1987

FIGURE NCSA-9d-1
 Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels
 Rocky Mountain Arsenal
 Prepared by Ebasco Services Incorporated

TABLE NCSA-9d-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9d

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Cadmium	3.7	Comp ^{1/} 0-1, 4-5	5063	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9d-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9d
AVERAGE SITE DEPTH TO GROUNDWATER: 40 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ALDRIN	0.20	23108	02/7/89
ATRAZINE	11	23108	11/14/88
BENZOTHAZOLE	2.8	23108	09/15/87
CHLOROFORM	7.6	23108	11/14/88
CHLORDANE	10	23108	02/7/89
CHLOROPHENYLMETHYL SULFONE	6.8	23108	09/15/87
DICYCLOPENTADIENE	15	23108	07/26/88
VAPONA	2.4	23108	11/14/88
DIISOPROPYLMETHYL PHOSPHONATE	1.6	23108	02/7/89
DIELDRIN	0.95	23108	02/7/89
DIMETHYLMETHYL PHOSPHONATE	0.94	23108	02/7/89
ENDRIN	0.068	23108	02/7/89
ISODRIN	0.092	23108	01/15/88
MALATHION	2.0	23108	02/7/89
1,4-OXATHIANE	6.5	23108	07/26/88
PPDDE	0.13	23108	02/7/89
PPDDT	0.12	23108	02/7/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALY
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9d-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9d

AVERAGE SITE DEPTH TO GROUNDWATER: 40 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
SUPONA	1.2	23108	02/7/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALY.
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9d-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-09
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-16
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	9.5E-12
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	9.1E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-13
PPDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	8.3E-11
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-10
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-07
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-13
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-14
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-11
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	7.3E-16
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-16
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	7.3E-12
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.2E-03	0.0E+00	8.2E-03	0.0E+00

NCSA-9d-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-09
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-16
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	9.5E-12
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	3.0E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	9.1E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-13
PPDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	8.3E-11
PPDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-10
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-07
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-13
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-14
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-11
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	7.3E-16
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-16
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	7.3E-12
CADMIUM	4.5E+02	0.0E+00	4.5E+02	8.2E-03	0.0E+00	8.2E-03	0.0E+00

NCSA-9d-5

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	2.0E-08
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-15
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.1E-11
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-07
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-12
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-09
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	8.1E-09
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	2.5E-06
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	2.6E-09
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-12
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.0E-13
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-10
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-15
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-15
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-10
CADMIUM	5.8E+01	0.0E+00	5.8E+01	6.4E-02	0.0E+00	6.4E-02	0.0E+00

NCSA-9d-6

EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-10
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-06
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	5.0E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-03
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-07
PPDDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	8.8E-05
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-01
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-07
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-08
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-05
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-10
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-10
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-06
CADMIUM	3.6E+02	0.0E+00	3.6E+02	1.0E-02	0.0E+00	1.0E-02	0.0E+00

NCSA-9d-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EN
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	9.7E-09	6.4E-
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	2.3E-15	1.5E-
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	7.1E-11	4.7E-
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-08	1.5E-
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.9E-08	4.5E-
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-12	1.1E-
PPDDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-10	4.1E-
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-09	2.7E-
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-06	1.9E-
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	1.3E-09	8.7E-
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	2.3E-12	1.5E-
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-13	1.5E-
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-10	1.2E-
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-15	3.6E-
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-15	1.7E-
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-11	3.6E-
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	4.9E-01*	0.0E+00	4.9E-01*	0.0E+00	0.0E+

*: EI is equal to or exceeds 1.0E-01

2.29 SITE NCSA-9e: SECTION 24 - ZINC DETECTION (formerly Section 24-Nonsource Area; ESE, 1988x/RIC 88203R03)

2.29.1 Site-Specific Considerations

Figure NCSA-9e-1 and Tables NCSA-9e-1 and NCSA-9e-2 depict the target contaminants for Site NCSA-9e. Boring 5088 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9e (ESE, 1988x/RIC 88203R03).

2.29.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9e are shown in Figure NCSA-9e-1. Table NCSA-9e-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury for Horizon 2 because the chance of direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9e-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.29.3 Site Exposure Summary

Tables NCSA-9e-3 through NCSA-9e-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9e is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9e is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

TABLE NCSA-9e-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9e

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Zinc	92	Comp ^{1/} 0-1, 4-5	5088	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9e-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9e

AVERAGE SITE DEPTH TO GROUNDWATER: 45 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
BENZENE	3.3	23008	09/14/8
CHLOROFORM	3.4	23008	09/14/8
CHLOROBENZENE	13	23008	09/14/1
DIELDRIN	0.12	23008	09/14/1

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTES
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9e-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI EI	EI EI	EI EI	OPN
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	5.1E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	7.8E-09
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-11
ZINC	2.0E+06	0.0E+00	2.0E+06	4.6E-05	0.0E+00	4.6E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9e-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	5.1E-08
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	7.8E-09
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-11
ZINC	2.0E+06	0.0E+00	2.0E+06	4.6E-05	0.0E+00	4.6E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9e-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	7.6E-07
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-07
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	6.6E-10
ZINC	1.1E+06	0.0E+00	1.1E+06	8.8E-05	0.0E+00	8.8E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9e-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	3.7E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	5.8E-04
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-06
ZINC	7.8E+05	0.0E+00	7.8E+05	1.2E-04	0.0E+00	1.2E-04	0.0E+00

NCSA-9e-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	EMI
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-07	1.1E-01
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-08	3.8E-01
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	5.9E-08	1.7E-01
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	3.3E-10	9.7E-01
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	6.6E-04	0.0E+00	6.6E-04	0.0E+00	0.0E+01

2.30 SITE NCSA-9f: SECTION 25 - ZINC AND COPPER DETECTIONS (formerly Section 25-Nonsource Area; ESE, 1988y/RIC 88063R09 and ESE, 1988z/RIC 88063R09A)

2.30.1 Site-Specific Considerations

Figure NCSA-9f-1 and Table NCSA-9f-1 depict the target contaminants for Site NCSA-9f. Boring 5140 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9f (ESE, 1988y/RIC 88063R09).

2.30.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9f are shown in Figure NCSA-9f-1. Table NCSA-9f-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury for Horizon 2 because the chance of direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.30.3 Site Exposure Summary

Tables NCSA-9f-2 through NCSA-9f-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9f is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

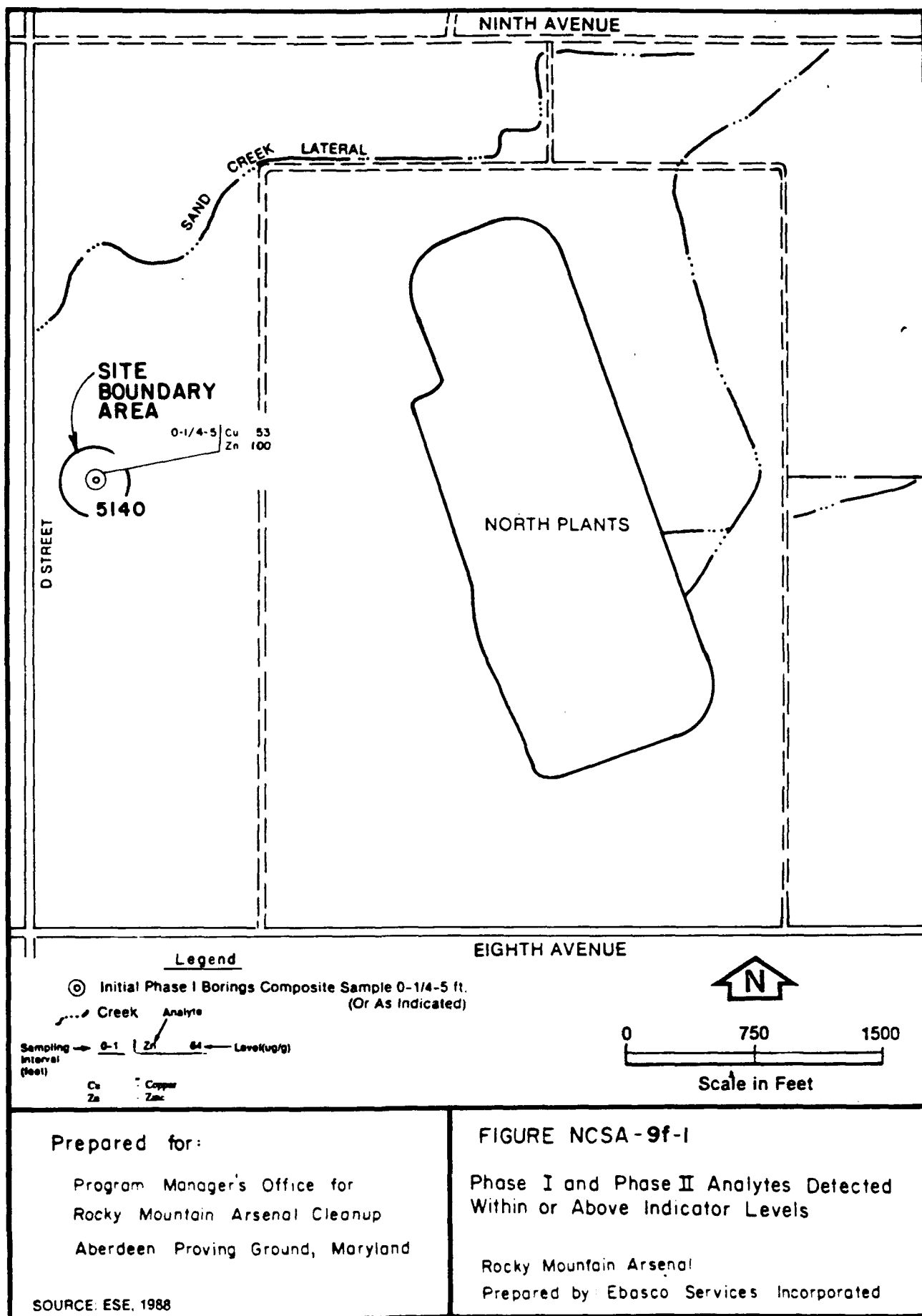


TABLE NCSA-9f-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9f

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Copper	53	Comp ^{1/} 0-1, 4-5	5140	--	--	--
Zinc	100	Comp 0-1, 4-5	5140	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

NCSA-9f-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
COPPER	4.2E+05	0.0E+00	4.2E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9f-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
COPPER	4.2E+05	0.0E+00	4.2E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00
ZINC	2.0E+06	0.0E+00	2.0E+06	5.0E-05	0.0E+00	5.0E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9f-4

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI E1	E1	E1	OPN
COPPER	2.5E+05	0.0E+00	2.5E+05	2.1E-04	0.0E+00	2.1E-04	0.0E+00
ZINC	1.1E+06	0.0E+00	1.1E+06	9.5E-05	0.0E+00	9.5E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9f-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
COPPER	1.8E+05	0.0E+00	1.8E+05	3.0E-04	0.0E+00	3.0E-04	0.0E+00
ZINC	7.8E+05	0.0E+00	7.8E+05	1.3E-04	0.0E+00	1.3E-04	0.0E+00

NCSA-9f-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
COPPER	5.7E+04	0.0E+00	0.0E+00	5.7E+04	9.3E-04	0.0E+00	9.3E-04	0.0E+00	0.0E+00
ZINC	1.4E+05	0.0E+00	0.0E+00	1.4E+05	7.2E-04	0.0E+00	7.2E-04	0.0E+00	0.0E+00

2.31 SITE NCSA-9g: SECTION 26 - SUSPECTED METHYLENE CHLORIDE
DETECTION (formerly Section 26-Uncontaminated; ESE, 1987j/RIC 87293R02;
Section 26-Nonsource Area; ESE, 1988q/RIC 87293R02A)

2.31.1 Site-Specific Considerations

Figure NCSA-9g-1 and Tables NCSA-9g-1 and NCSA-9g-2 depict the target contaminants for Site NCSA-9g. Boring 4533 was included in this exposure assessment, consistent with the North Central SAR. The historical search conducted for Site NCSA-9g revealed that methylene chloride was suspected to be present, however, no chemicals from the RMA target contaminant list were detected in the soil during the Phase I and Phase II investigations (ESE, 1987j/RIC 87293R02).

2.31.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9g are shown in Figure NCSA-9g-1. Table NCSA-9g-1 shows that no target contaminants were found above the indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-9g-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.31.3 Site Exposure Summary

Tables NCSA-9g-3 through NCSA-9g-7 present Draft PPLVs and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9g is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity.

No soil contaminants are shown on Table NCSA-9g-1, therefore, no COCs were identified for this site. Site NCSA-9g is designated as a Priority 2 site.

The following groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (enclosed)

- Chloroform (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Dicyclopentadiene (enclosed)
- Tetrachloroethylene (enclosed)
- 1,2-Dichloroethane (enclosed)

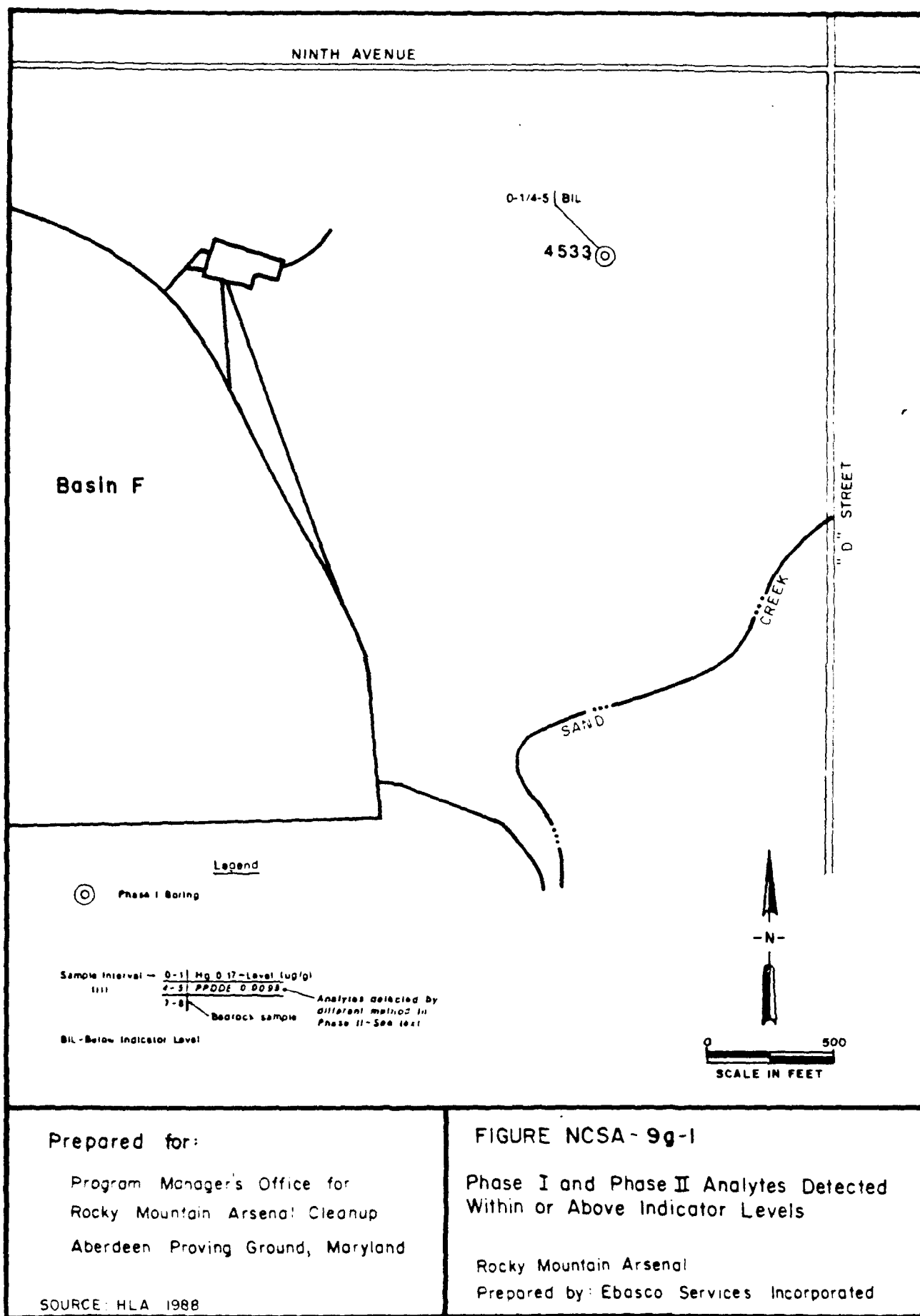


TABLE NCSA-9g-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9g

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
None	--	--	--	--	--	--
NCSA Max. ug/g ft	North Central Study Area Max num microgram per gram foot/feet					

TABLE NCSA-9g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9g
AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1-DICHLOROETHYLENE	230	26157	07/27/88
1,1-DICHLOROETHANE	6.7	26133	08/11/88
1,2-DICHLOROETHYLENE	14	26133	02/10/89
1,2-DICHLOROETHANE	950	26133	02/10/89
M-XYLENE	13	26133	11/16/88
ALDRIN	10	26157	11/21/88
ATRAZINE	92	26157	11/21/88
BICYCLOHEPTADIENE	1100	26133	01/21/88
BENZOTHIAZOLE	26	26133	11/16/88
BENZENE	520	26133	08/11/88
METHYLENE CHLORIDE	1300	26133	02/10/89
CHLOROFORM	86000	26133	11/16/88
HEXACHLOROCYCLOPENTADIENE	10	26133	08/11/88
CHLOROBENZENE	19	26133	02/10/89
CHLORDANE	98	26157	02/13/89
CHLOROPHENYLMETHYL SULFIDE	790	26133	05/4/88
CHLOROPHENYLMETHYL SULFOXIDE	200	26133	11/16/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9g

AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROPHENYLMETHYL SULFONE	860	26157	07/27/88
DIBROMOCHLOROPROPANE	53	26133	01/21/88
DICYCLOPENTADIENE	1500	26133	01/21/88
DIISOPROPYLMETHYL PHOSPHONATE	1100	26157	11/21/88
DITHIANE	180	26133	11/16/88
DIELDRIN	1.8	26157	11/21/88
DIMETHYL DISULFIDE	7.0	26133	11/16/88
DIMETHYLMETHYL PHOSPHONATE	1300	26133	02/10/89
ENDRIN	1.1	23007	01/15/88
ETHYLBENZENE	13	26133	08/11/88
ISODRIN	1.5	26157	11/21/88
TOLUENE	280	26133	02/10/89
METHYLISOBUTYL KETONE	350	26133	02/10/89
MALATHION	2.3	26157	02/13/89
1,4-OXATHIANE	23	26133	11/16/88
PPDDE	0.85	26157	07/27/88
PPDDT	0.79	26157	02/13/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9g-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9g

AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
PARATHION	15	26157	11/21/88
SUPONA	1.3	26157	02/13/89
TETRACHLOROETHYLENE	1100	26133	05/4/88
TRICHLOROETHYLENE	230	26157	11/21/88
O,P-XYLENE	75	26133	08/11/88

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

NCSA-9g-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-04
BENZOTRIAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	6.8E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.5E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.1E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-09
PPDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-08
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-07
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-09
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-04
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.3E-02
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	2.9E-03
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-08
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.8E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-05
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-14
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-08
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-04
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	2.7E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-04
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.9E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	4.5E-08

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9g-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-06
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	2.0E-13
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	6.8E-09
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.5E-06
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-07
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.1E-03
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-07
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-09
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-08
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.7E-07
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-09
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.3E-04
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.3E-02
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	2.9E-03
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	3.8E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-05
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-08
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.6E-14
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-08
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.6E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-11
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-04
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	2.7E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-04
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	7.9E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	4.5E-08

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9g-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	7.7E-05
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-12
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-03
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-08
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	5.6E-05
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-05
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	6.6E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-01
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-06
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-08
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.4E-09
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	6.1E-07
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-06
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-03
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-08
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	5.0E-03
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-01
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-02
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	3.9E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-07
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-07
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.5E-10
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	3.7E-08
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	3.5E-04
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-07
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-13
METHYLSOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	9.3E-08
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-03
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	6.7E-11
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-13
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	4.7E-03
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	1.7E-07
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-03
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	5.1E-08
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	2.9E-07

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9g-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	9.1E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	5.8E-01
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	2.9E-02
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.4E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	9.2E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-06
PPDDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	7.2E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	4.9E-04
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-01
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-06
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.9E-01
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	5.8E+01
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.5E+01
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-05
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	8.4E-05
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-04
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	2.0E-07
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-05
HEXACHLOROCCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-01
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-10
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	7.6E-05
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	5.5E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	1.4E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-01
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	4.2E-05
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	2.4E-04

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9g-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	3.9E-05	2.7E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-12	1.0E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-03	1.7E+00
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	5.1E-08	3.6E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-05	2.9E-02
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-05	1.2E-02
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	7.7E-07	5.5E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.0E-02	4.3E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-06	9.2E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-08	1.2E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.5E-09	5.3E-06
PPDDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-07	2.2E-04
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-06	1.5E-03
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-04	3.7E-01
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	8.6E-09	6.1E-06
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	2.5E-03	1.8E+00
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-01	1.7E+02
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-02	1.5E+01
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	1.9E-07	1.4E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-07	8.4E-05
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-07	2.1E-04
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-10	2.0E-07
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-08	3.0E-05
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	4.0E-04	2.9E-01
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-07	1.7E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-13	3.5E-10
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-07	7.6E-05
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-03	8.8E-01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	7.7E-11	5.5E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-13	1.5E-10
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-03	1.6E+00
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-07	1.4E-04
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	9.4E-04	6.7E-01
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-08	4.2E-05
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-07	2.4E-04

2.32 SITE NCSA-9h: SECTION 26 - CADMIUM DETECTION (formerly Section 26-Uncontaminated; ESE, 1987j/RIC 87293R02; Section 26-Nonsource Area; ESE, 1988q/RIC 87293R02A)

2.32.1 Site-Specific Considerations

Figure NCSA-9h-1 and Tables NCSA-9h-1 and NCSA-9h-2 depict the target contaminants for Site NCSA-9h. Borings 4512 and 4683 through 4685 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9g (ESE, 1987j/RIC 87293R02).

2.32.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9h are shown in Figure NCSA-9h-1. Table NCSA-9h-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9h-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.32.3 Site Exposure Summary

Tables NCSA-9h-3 through NCSA-9h-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9h is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	Direct	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-9h is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

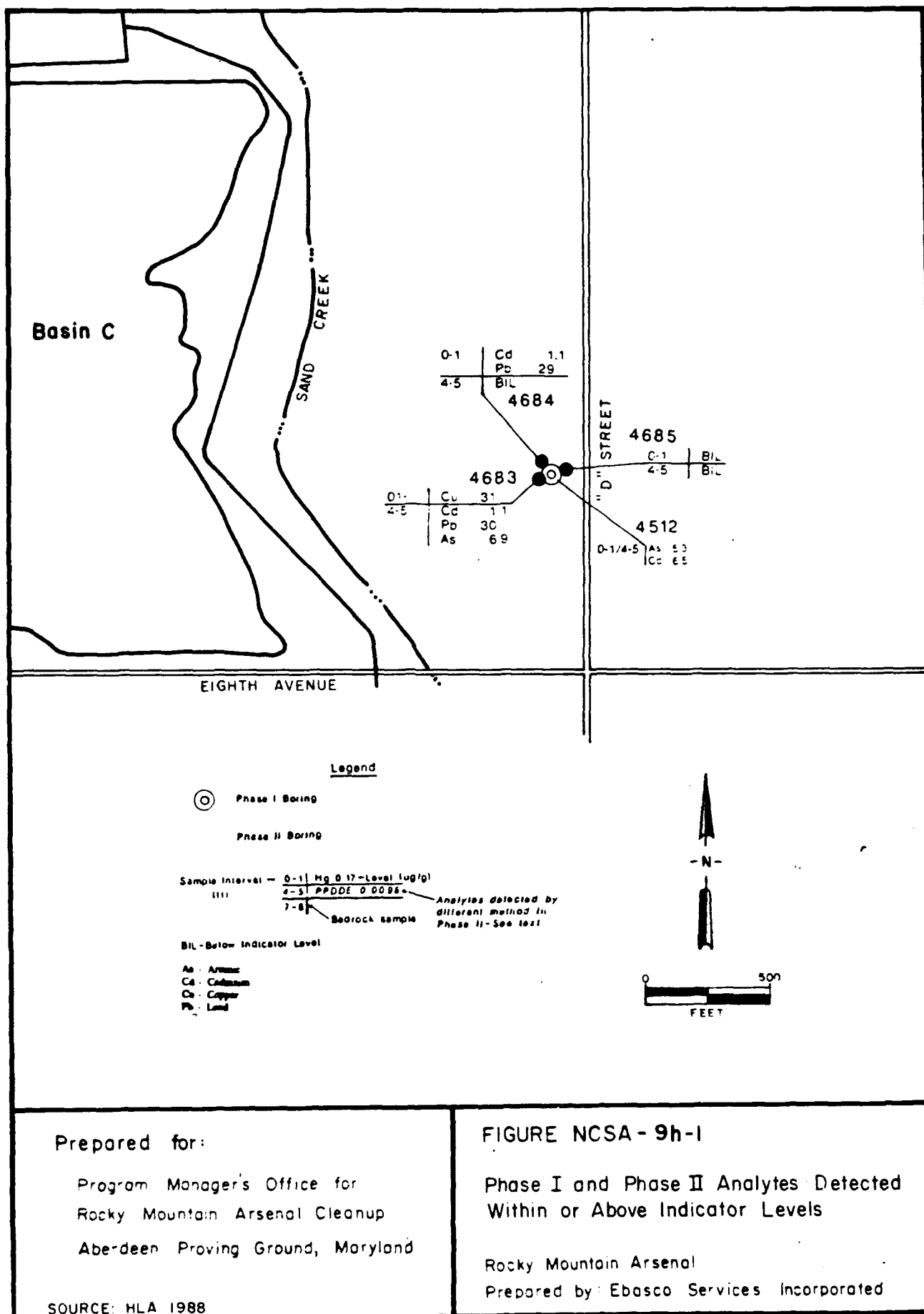


TABLE NCSA-9h-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9h

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Cadmium	6.5	Comp ^{1/} 0-1, 4-5	4512	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9h-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9h
AVERAGE SITE DEPTH TO GROUNDWATER: 46 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
BENZENE	6.4	26159	01/24/89
CHLOROFORM	1.5	26159	01/24/89
CHLOROBENZENE	150	26159	01/24/89
TOLUENE	1.5	26159	01/24/89
TETRACHLOROETHYLENE	1.3	26159	01/24/89
TRICHLOROETHYLENE	5.8	26159	01/24/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

K-1A-9h-3

EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-09
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-08
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.0E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	8.8E-08
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.4E-02	0.0E+00	1.4E-02	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9h-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-07
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.2E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-09
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.0E-08
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	4.0E-12
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	8.8E-08
CADMIUM	4.5E+02	0.0E+00	4.5E+02	1.4E-02	0.0E+00	1.4E-02	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9h-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-06
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	5.9E-08
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-07
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	2.6E-11
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-06
CADMIUM	5.8E+01	0.0E+00	5.8E+01	1.1E-01*	0.0E+00	1.1E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9h-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	7.1E-03
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-03
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.5E-04
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-04
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	7.7E-07
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	5.7E-03
CADMIUM	3.6E+02	0.0E+00	3.6E+02	1.8E-02	0.0E+00	1.8E-02	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9h-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	8.3E-07	2.1E-02
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-07	4.3E-03
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-08	7.5E-04
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	7.7E-08	2.0E-03
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-11	7.7E-07
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-07	1.7E-02
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	8.5E-01*	0.0E+00	8.5E-01*	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.33 SITE NCSA-9i: SECTION 26 - BUTOXYETHANOL DETECTION (formerly Section 26-Uncontaminated; ESE, 1987j/RIC 87293R02; formerly Section 26-Nonsource Area; ESE, 1988q/RIC 87293R02A)

2.33.1 Site-Specific Considerations

Figure NCSA-9i-1 and Table NCSA-9i-1 depict the target contaminants for Site NCSA-9i. Boring 4501 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9i (ESE, 1987j/RIC 87293R02).

2.33.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9i are shown in Figure NCSA-9i-1. 2-Butoxyethanol, occurring in Boring 4501 (0-1/4-5 ft), was not included in this figure since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown in this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-9i-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Table NCSA-9i-1 shows that no target contaminants were found above the indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.33.3 Site Exposure Summary

Only nontarget soil contaminants are shown on Table NCSA-9i-1. Since nontarget contaminants (excluding 1,1,2,2-tetrachloroethane) were not assessed using the PPLV methodology, no COCs were identified for this site. Site NCSA-9i is designated as a Priority 2 site.

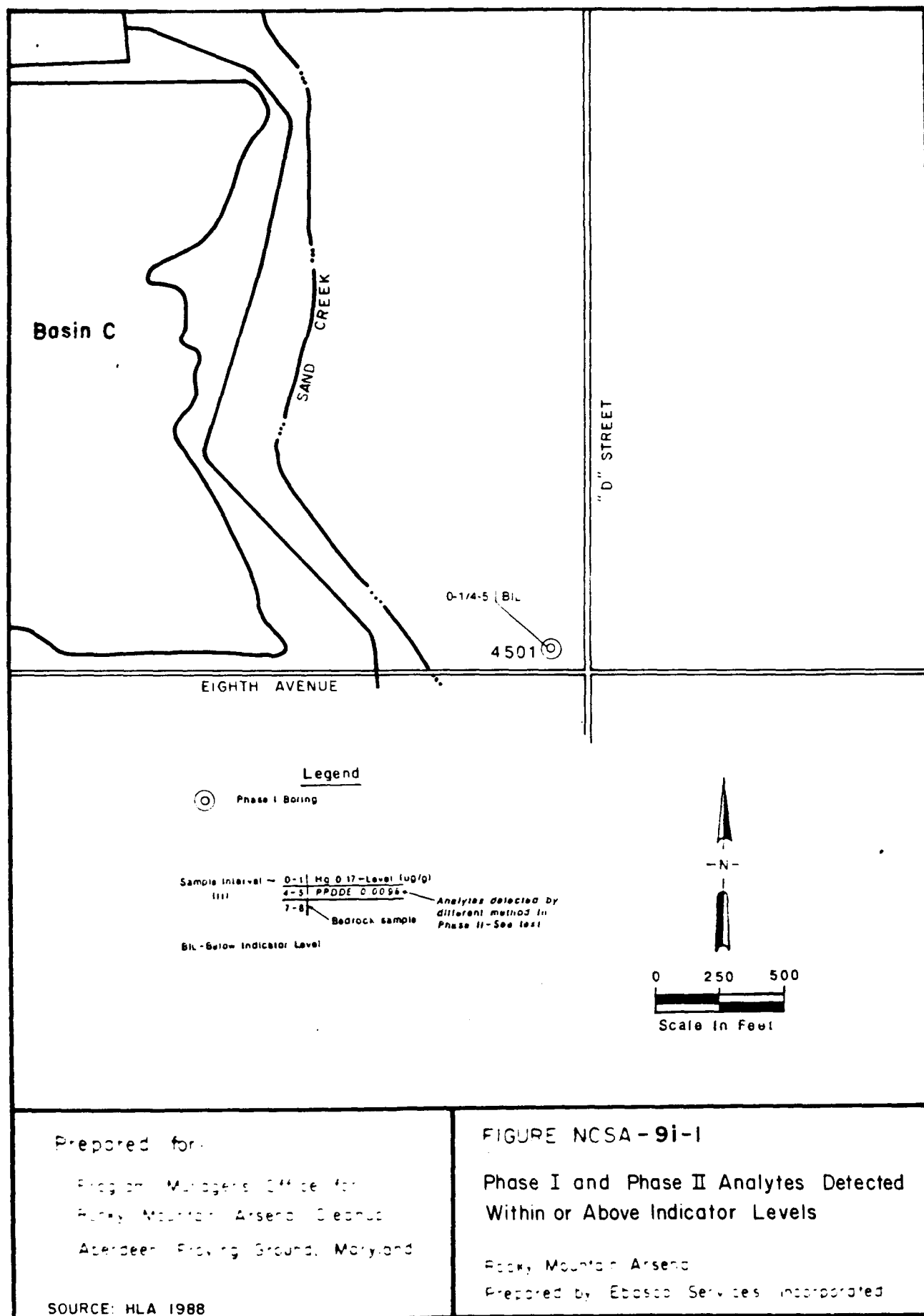


TABLE NCSA-9i-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9i

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
2-Butoxyethanol ^{1/}	2.0	Comp ^{2/} 0-1, 4-5	4501	2.0	Comp 0-1, 4-5	4501

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

2/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

2.34 SITE NCSA-9j: SECTION 26 - MERCURY DETECTION (formerly Section 26-Uncontaminated; ESE, 1987j/RIC 87293R02; Section 26-Nonsource Area; ESE, 1988q/RIC 89293R02A)

2.34.1 Site-Specific Considerations

Figure NCSA-9j-1 and Tables NCSA-9j-1 and NCSA-9j-2 depict the target contaminants for Site NCSA-9j. Borings 4527 and 4686 through 4771 were included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9j (ESE, 1987j/RIC 87293R02).

2.34.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9j are shown in Figure NCSA-9j-1. Table NCSA-9j-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9j-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

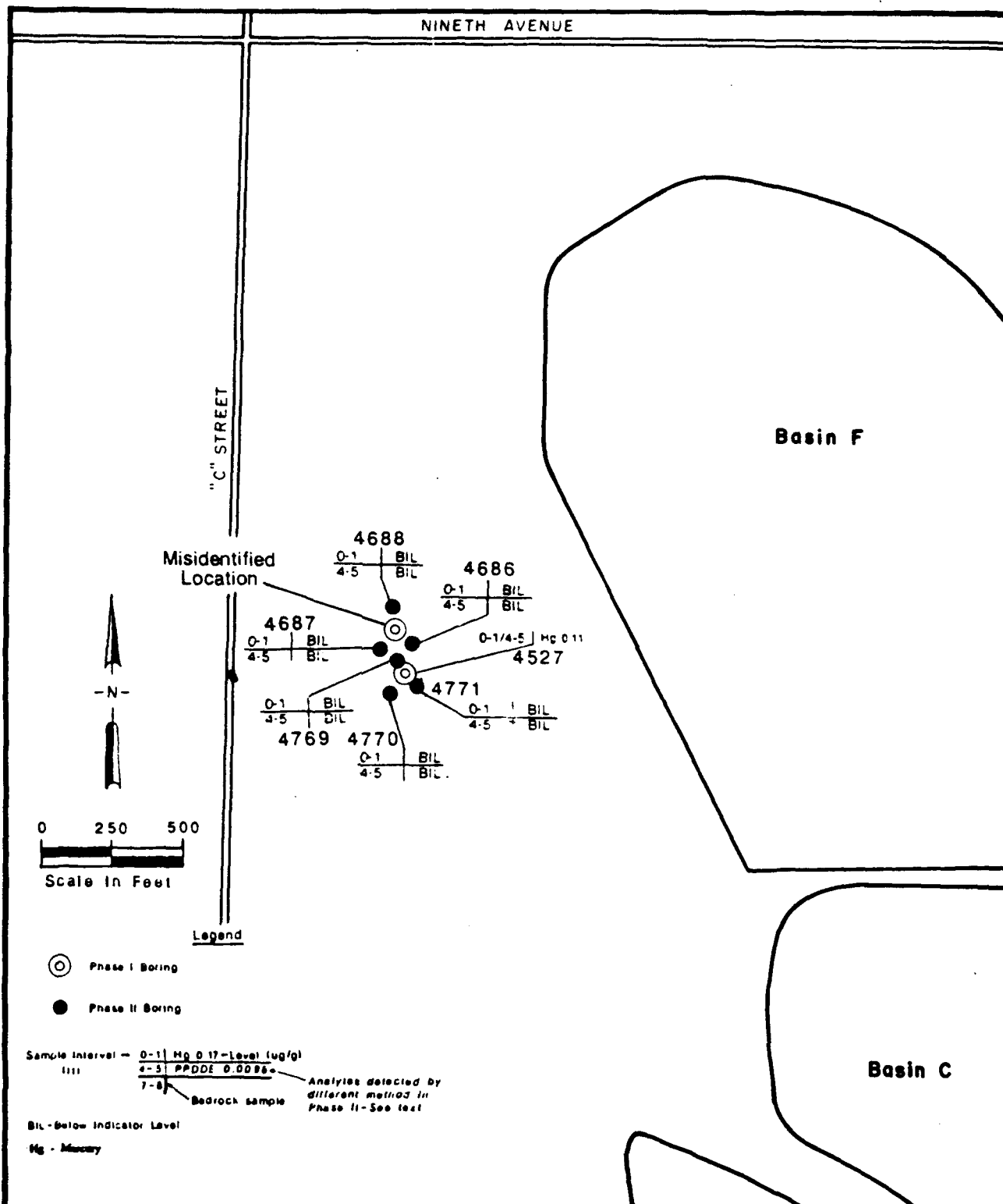
2.34.3 Site Exposure Summary

Tables NCSA-9j-3 through NCSA-9j-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9j is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9j is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

SOURCE: HLA 1988

FIGURE NCSA-9j-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by: Ebasco Services Incorporated

TABLE NCSA-9j-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9j

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Mercury	0.11	Comp" 0-1, 4-5	4527	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9j-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9j

AVERAGE SITE DEPTH TO GROUNDWATER: 34 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ALDRIN	0.66	26083	02/15/89
ATRAZINE	6.0	26083	11/17/88
CHLOROFORM	0.93	26076	01/26/88
DIISOPROPYLMETHYL PHOSPHONATE	400	26076	01/26/88
DIELDRIN	8.7	26083	11/17/88
DIMETHYLMETHYL PHOSPHONATE	8.2	26083	11/17/88
ENDRIN	0.29	26076	01/26/88
ISODRIN	0.41	26083	02/15/89
MALATHION	1.6	26083	11/17/88
PPDDE	0.14	26083	02/15/89
PPDDT	0.086	26083	02/15/89
PARATHION	1.0	26083	11/17/88
SUPONA	1.6	26083	11/17/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9j-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-15
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.3E-09
PPDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	6.2E-10
PPDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-09
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-10
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.4E-10
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	9.3E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	8.1E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.3E-15
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	6.4E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.3E-15
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-05	0.0E+00	3.3E-05	0.0E+00

NCSA-9j-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	3.2E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-15
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.3E-09
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	6.2E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-09
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-10
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.4E-10
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	9.3E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	8.1E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.3E-15
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	6.4E-14
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.3E-15
MERCURY	3.3E+03	0.0E+00	3.3E+03	3.3E-05	0.0E+00	3.3E-05	0.0E+00

NCSA-9j-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	4.8E-07
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-15
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-07
PPDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	9.3E-09
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-08
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	1.9E-09
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	1.8E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-09
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	6.0E-12
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-09
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-14
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-13
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-14
MERCURY	2.0E+03	0.0E+00	2.0E+03	5.6E-05	0.0E+00	5.6E-05	0.0E+00

NCSA-9j-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-04
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-10
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.3E-04
PPDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-05
PPDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	7.9E-05
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-06
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-04
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-05
DIMETHYMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	7.8E-08
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-05
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-10
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-09
SUFON	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-10
MERCURY	1.4E+03	0.0E+00	1.4E+03	7.9E-05	0.0E+00	7.9E-05	0.0E+00

NCSA-9j-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	2.4E-07	2.7E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	9.1E-15	1.0E-10
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.2E-08	6.9E-04
PPDDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-09	5.2E-05
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-08	2.4E-04
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	9.5E-10	1.1E-05
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	8.8E-08	9.9E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.1E-09	4.6E-05
DIMETHYMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	7.0E-12	7.8E-08
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	6.1E-09	6.8E-05
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.2E-14	3.6E-10
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	4.8E-13	5.4E-09
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-14	2.8E-10
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	2.4E-04	0.0E+00	2.4E-04	0.0E+00	0.0E+00

2.35 SITE NCSA-9k: SECTION 26 - TRICHLOROPROPENE DETECTION (formerly Section 26-Uncontaminated; ESE, 1987j/RIC 87293R02; Section 26-Nonsource Area; ESE, 1988q/RIC 87293R02A)

2.35.1 Site-Specific Considerations

Figure NCSA-9k-1 and Tables NCSA-9k-1 and NCSA-9k-2 depict the target contaminants for Site NCSA-9k. Boring 4507 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9k (ESE, 1987j/RIC 87293R02).

2.35.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9k are shown in Figure NCSA-9k-1. Trichloropropene, occurring in Boring 4507 (0-1/4-5 ft), was not included in this figure since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown in this figure, this nontarget compound was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

Table NCSA-9k-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Table NCSA-9k-1 shows that no target contaminants were found above indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-9k-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

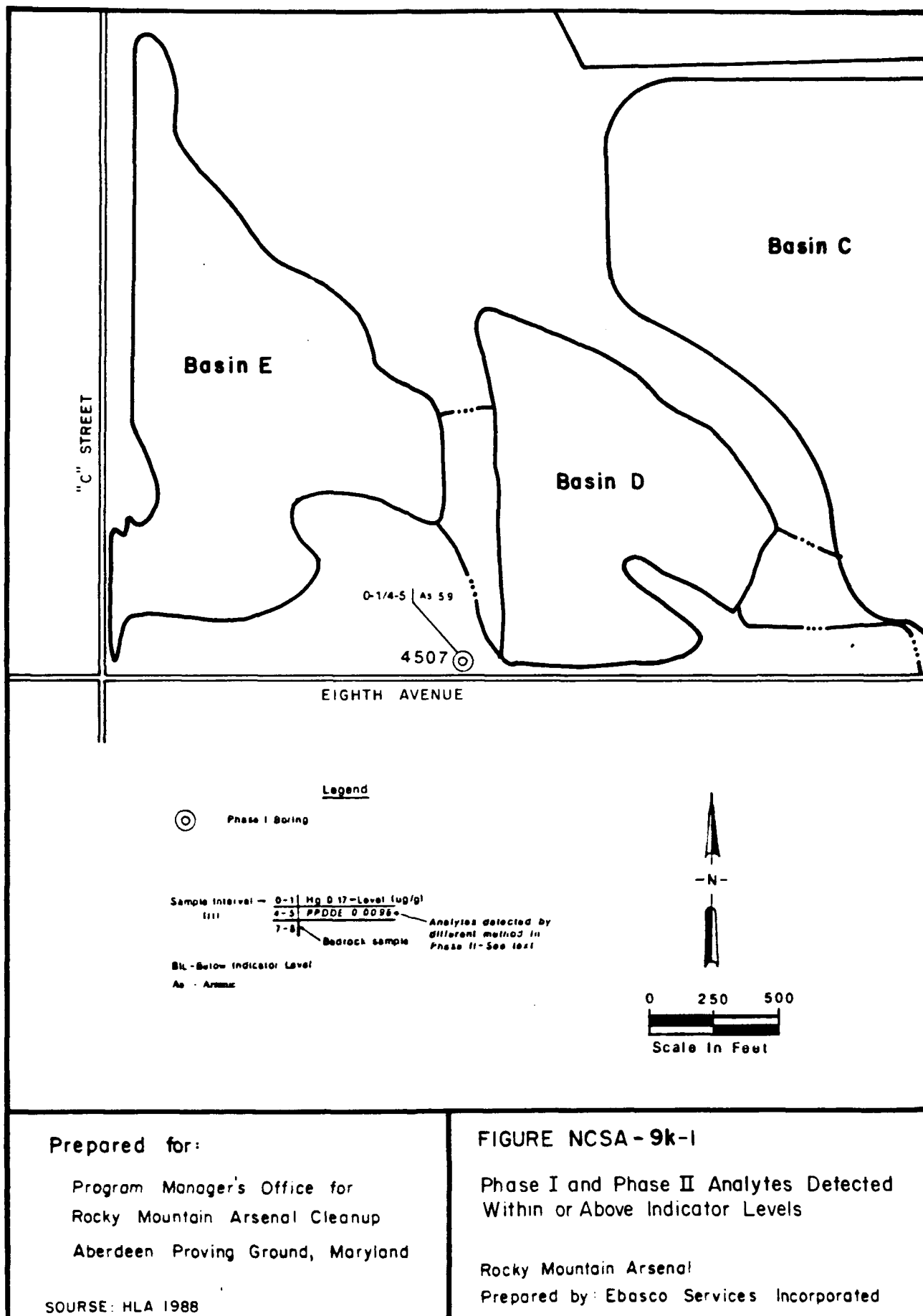
2.35.3 Site Exposure Summary

Tables NCSA-9k-3 through NCSA-9k-7 present Draft PPLVs and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9k is greater than 10 ft,

the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity.

Only nontarget soil contaminants are shown on Table NCSA-9k-1. Since nontarget contaminants (excluding 1,1,2,2-tetrachloroethane) were not assessed using the PPLV methodology, no COCs were identified for this site. Site NCSA-9k is designated as a Priority 2 site.

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Prepared for:

Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland

SOURCE: HLA 1988

FIGURE NCSA-9k-1

Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels

Rocky Mountain Arsenal
 Prepared by: Ebasco Services Incorporated

TABLE NCSA-9k-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9k

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Trichloropropene ^{1/}	1.0	Comp ^{2/} 0-1, 4-5	4507	1.0	Comp 0-1, 4-5	4507

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

2/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA North Central Study Area
Max. Maximum
ug/g microgram per gram
ft foot/feet

TABLE NCSA-9k-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9k
AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,2-DICHLOROETHANE	5.4	26006	11/21/88
ALDRIN	0.81	26006	11/21/88
ATRAZINE	24	26006	11/21/88
CHLOROFORM	1.1	26006	11/21/88
CHLOROBENZENE	5.4	26006	11/21/88
CHLOROPHENYLMETHYL SULFONE	660	26006	11/21/88
DIBROMOCHLOROPROPANE	0.26	26006	11/21/88
VAPONA	0.88	26006	11/21/88
DIISOPROPYLMETHYL PHOSPHONATE	980	26006	11/21/88
DITHIANE	220	26006	11/21/88
DIELDRIN	0.17	26006	11/21/88
ENDRIN	0.12	26006	11/21/88
ISODRIN	0.12	26006	11/21/88
MALATHION	6.0	26006	11/21/88
1,4-OXATHIANE	14	26006	11/21/88
PPDDT	0.14	26006	11/21/88
PARATHION	4.6	26006	11/21/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9k-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9k
AVERAGE SITE DEPTH TO GROUNDWATER: 33 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
SUPONA	3.8	26006	11/21/88
TETRACHLOROETHYLENE	1.1	26006	11/21/88
TRICHLOROETHYLENE	2.6	26006	11/21/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9k-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-15
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-11
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-09
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-08
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-11
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.1E-10
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-11
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-15
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.1E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.2E-08
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	7.4E-12

NCSA-9k-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-15
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-09
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-11
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-09
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-08
1,2-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-08
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-11
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.1E-10
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-13
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	9.2E-11
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-15
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.1E-15
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	5.2E-08
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	7.4E-12

NCSA-9k-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	2.3E-07
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-14
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	6.8E-09
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-08
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-10
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	2.6E-08
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-07
1,2-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	1.0E-06
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	1.3E-09
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.3E-09
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-12
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	5.9E-10
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-14
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	7.2E-13
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-14
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	1.7E-07
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	7.9E-07
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-10

NCSA-9k-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-03
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-10
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-04
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	9.3E-04
1,2-DICHLOROETHANE	3.5E+02	0.0E+00	3.5E+02	0.0E+00	0.0E+00	0.0E+00	5.2E-03
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	6.7E-06
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-04
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-08
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.1E-05
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	1.4E-09
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	2.6E-08
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	7.1E-10
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	8.6E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-03
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	5.6E-07

NCSA-9k-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	1.1E-07	3.4E-03
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-14	4.2E-10
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	7.9E-09	2.4E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-08	8.3E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.6E-10	1.4E-05
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-08	4.0E-04
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	9.1E-08	2.8E-03
1,2-DICHLOROETHANE	2.2E+01	0.0E+00	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-07	1.6E-02
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	6.5E-10	2.0E-05
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-09	1.2E-04
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-12	3.6E-08
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	6.9E-10	2.1E-05
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.7E-14	1.4E-09
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-13	2.6E-08
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-14	7.1E-10
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	8.4E-08	2.6E-03
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	3.9E-07	1.2E-02
VAPONA	5.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-11	1.7E-06

2.36 NCSA-91: SECTION 27 - ARSENIC DETECTION (formerly Section 27-Nonsource Area; ESE, 1987o/RIC 88013R02)

2.36.1 Site-Specific Considerations

Figure NCSA-91-1 and Table NCSA-91-1 depict the target contaminants for Site NCSA-91. Boring 5182 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-91 (ESE, 1987o/RIC 88013R02).

2.36.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-91 are shown in Figure NCSA-91-1. Table NCSA-91-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.36.3 Site Exposure Summary

Tables NCSA-91-2 through NCSA-91-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Arsenic	Direct	Direct	Direct	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-91 is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

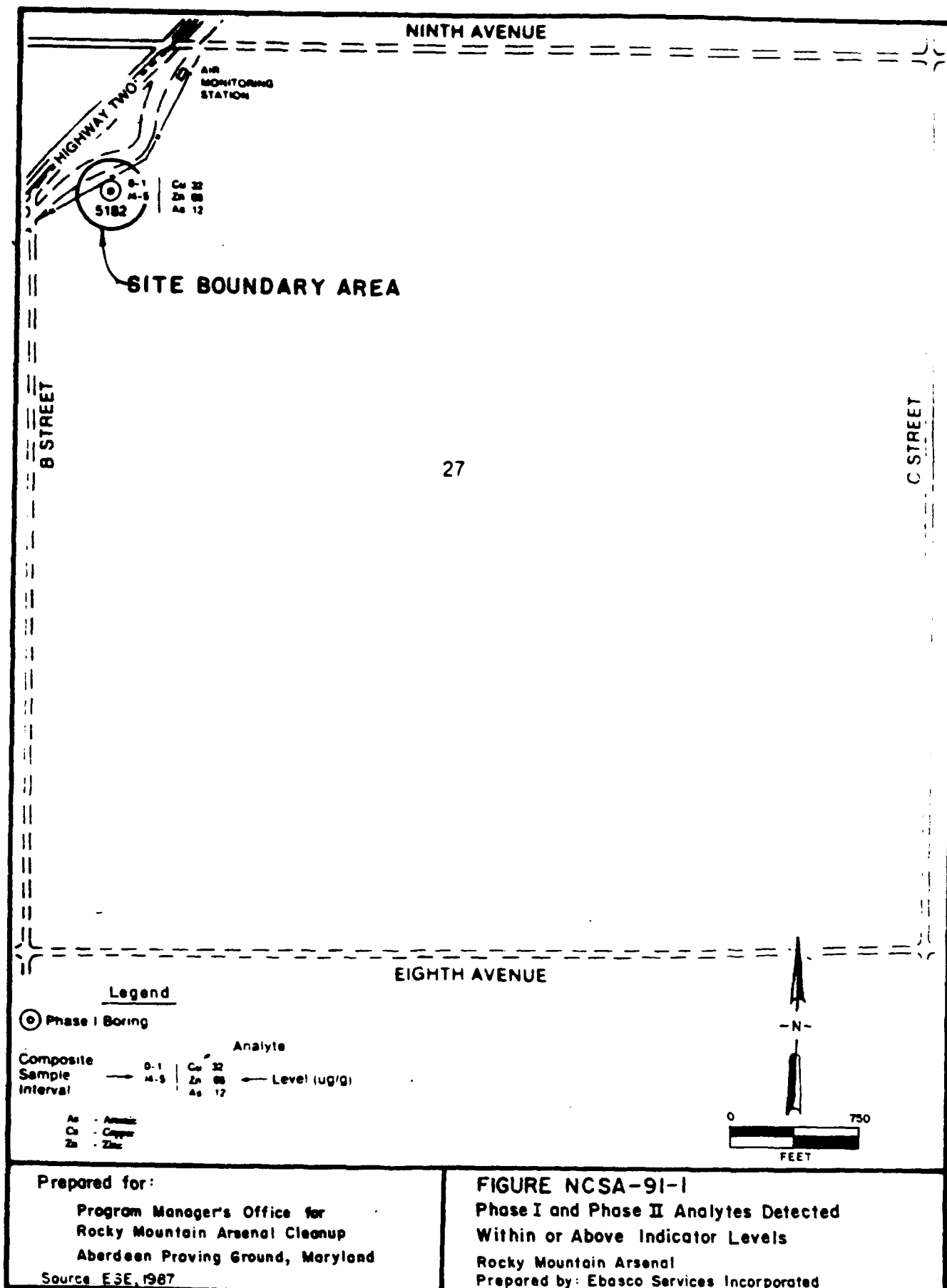


TABLE NCSA-9I-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9I

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Arsenic	12	Comp" 0-1, 4-5	5182	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

NCSA-91-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E-01*	0.0E+00	5.6E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-91-3
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E-01*	0.0E+00	5.6E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-91-4
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ARSENIC	3.9E+00	0.0E+00	3.9E+00	3.0E+00*	0.0E+00	3.0E+00*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-91-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ARSENIC	2.0E+01	0.0E+00	2.0E+01	6.0E-01*	0.0E+00	6.0E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-91-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV	OSVI	ESVI	PPLV	EI	EI	EI	OPN	ENC
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)					
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	7.4E+00*	0.0E+00	7.4E+00*	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.37 SITE NCSA-9m: ZINC DETECTION IN BEDROCK (formerly Section 35-6: Possible Munitions Test Area; ESE, 1988aa/RIC 88293R04)

2.37.1 Site-Specific Considerations

Figure NCSA-9m-1 and Tables NCSA-9m-1 and NCSA-9m-2 depict the target contaminants for Site NCSA-9m. Boring 4070 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from RMA target contaminant list were suspected to be present in Site NCSA-9m (ESE, 1988aa/RIC 88293R04).

2.37.2 Spatial Distribution of Measured Contaminant Concentrations

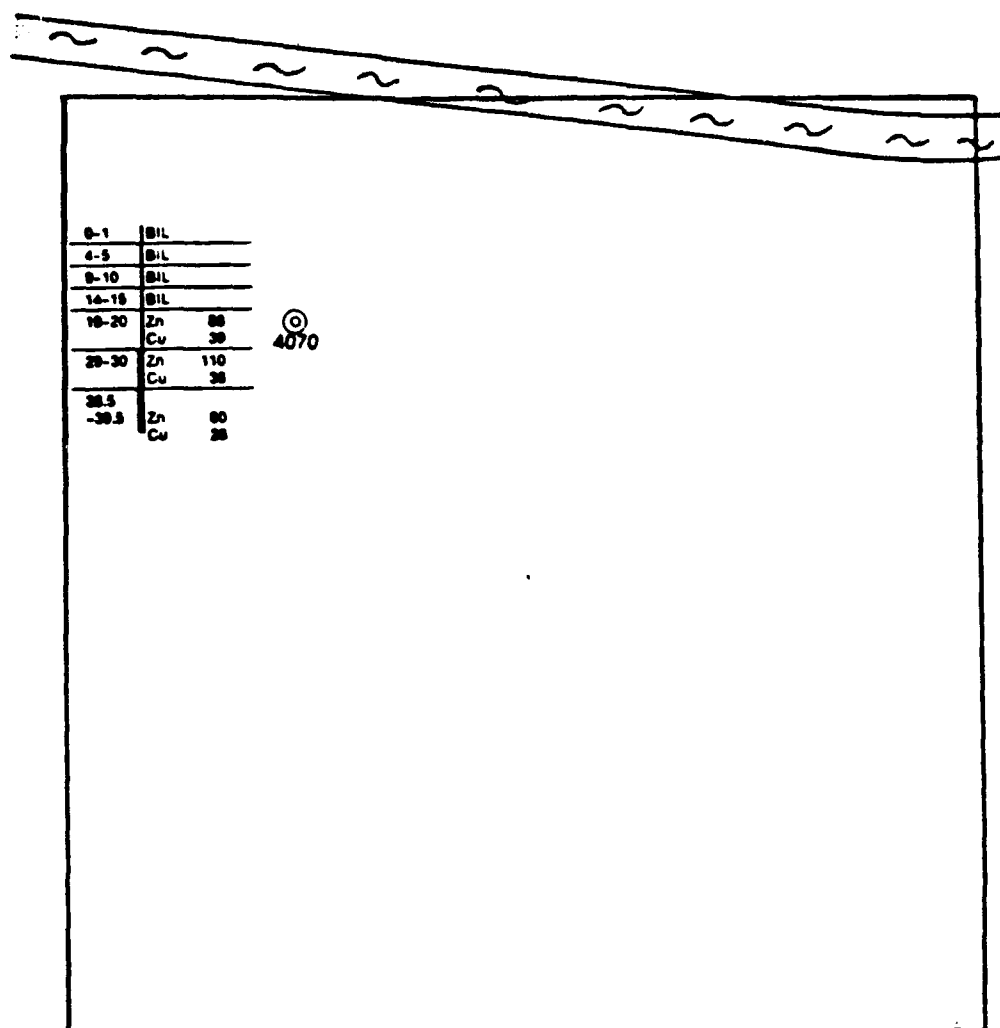
The locations and concentrations of the target contaminants that were detected in Site NCSA-9m are shown in Figure NCSA-9m-1. Table NCSA-9m-1 shows that no target contaminants were found above the indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-9m-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.37.3 Site Exposure Summary


Tables NCSA-9m-3 through NCSA-9m-7 present Draft PPLVs and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9m is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity.

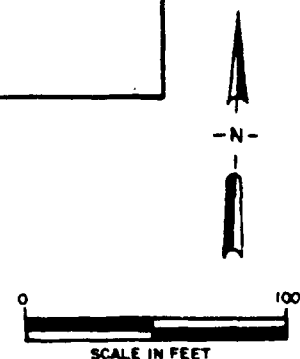
No soil contaminants are shown on Table NCSA-9m-1, therefore, no COCs were identified for this site. Site NCSA-9m is designated as a Priority 2 site.

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.



Legend
4070(⊙) Phase I Boring

	Analyte		
Sampling Interval	0-1	Zn 80	Level (ug/g)
	4-5	BIL	
	9-10	BIL	
Bedrock Sample			
BB.	Below indicator level		
Cu	Copper		
Zn	Zinc		
	Drainage Ditch		



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

SOURCE: ESE, 1987

FIGURE NCSA - 9m-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by Ebasco Services Incorporated

TABLE NCSA-9m-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9m

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
None	--	--	--	--	--	--
NCSA Max. ug/g ft	North Central Study Area Maximum microgram per gram foot/feet					

TABLE NCSA-9m-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9m
AVERAGE SITE DEPTH TO GROUNDWATER: 41 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
ALDRIN	0.21	35091	01/23/89
CHLOROFORM	460	35091	01/23/89
CHLOROBENZENE	70	35091	01/23/89
DIISOPROPYLMETHYL PHOSPHONATE	93	35091	01/23/89
TETRACHLOROETHYLENE	1.4	35091	01/23/89
TRICHLOROETHYLENE	4.2	35091	01/23/89

**EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990**

NCSA-9m-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.8E-11
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-08

NCSA-9m-4

EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-09
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-06
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-08
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.8E-11
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-08
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-08

NCSA-9m-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	6.9E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	2.8E-05
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-07
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.7E-10
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	2.5E-07
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.5E-06

NCSA-9m-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	8.9E-02
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	2.3E-03
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	8.2E-06
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	7.8E-04
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	4.7E-03

NCSA-9m-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	3.4E-08	6.5E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-05	2.7E-01
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-07	2.3E-03
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.3E-10	8.2E-06
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-07	2.3E-03
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-07	1.4E-02

2.38 SITE NCSA-9n: SECTION 35 - TRICHLOROPROPENE DETECTION (formerly Section 35-Uncontaminated; ESE 1987m/RIC 87313R01; Section 35-Nonsource Area; ESE, 1988t/RIC 87313R01A)

2.38.1 Site-Specific Considerations

Figure NCSA-9n-1 and Table NCSA-9n-1 depict the target contaminants for Site NCSA-9n. Boring 4024 was included in this exposure assessment, consistent with the North Central SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9n (ESE, 1987m/RIC 87313R01).

2.38.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9n are shown in Figure NCSA-9n-1. Toluene was detected in the nontarget analysis, but it is still considered a target contaminant in this exposure assessment (see Appendix A). Trichloropropene, occurring in Boring 4024 (0-1/4-5 ft), was not included in this figure, since it was not considered a target contaminant during the Phase I and Phase II investigations. Although not shown in this figure, trichloropropene was included in the North Central SAR and in this exposure assessment because it passed through the screening process performed in the RMA Chemical Index (EBASCO, 1988a/RIC 88357R01).

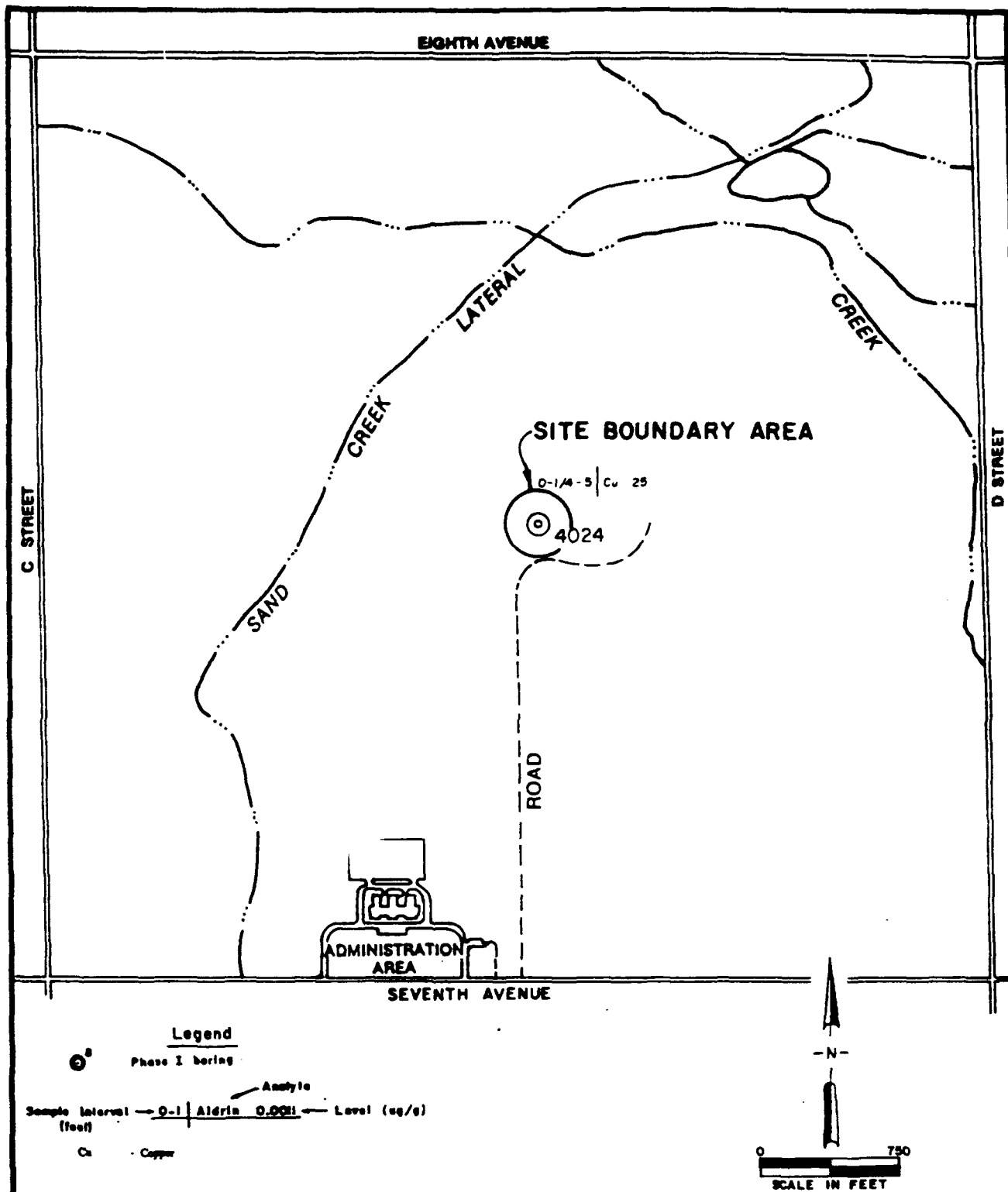
Table NCSA-9n-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury and CRLs for organic contaminants from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. Table NCSA-9n-1 shows that no target contaminants were found above indicator level. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). Based on available groundwater data from the first quarter 1987 to the first quarter 1989 sampling period, no evidence of groundwater contamination beneath this site was found (see Volume VI-A).

2.38.3 Site Exposure Summary

Tables NCSA-9n-2 through NCSA-9n-6 present Draft PPLVs and EIs for each site contaminant. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9n is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

SOURCE: ESE, 1987

FIGURE NCSA-9n-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by Ebasco Services Incorporated

TABLE NCSA-9n-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9n

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Trichloropropene ^{1/}	0.40	Comp ^{2/} 0-1, 4-5	4024	0.40	Comp 0-1, 4-5	4024
Toluene ^{1/}	0.3	Comp 0-1, 4-5	4024	0.3	Comp 0-1, 4-5	4024

1/ Nontarget contaminant. Refer to the exposure assessment nontarget screen in Appendix A.

2/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft
North Central Study Area
Maximum
microgram per gram
foot/feet

NCSA-9n-2
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPW
TOLUENE	2.5E+06	1.4E+09	2.5E+06	1.2E-07	2.2E-10	1.2E-07	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9n-3

EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
TOLUENE	2.5E+06	1.4E+09	2.5E+06	1.2E-07	2.2E-10	1.2E-07	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9n-4

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
TOLUENE	1.1E+06	4.9E+08	1.1E+06	2.8E-07	6.1E-10	2.8E-07	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9n-5
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
TOLUENE	1.4E+06	1.9E+04	1.9E+04	2.2E-07	1.6E-05	1.6E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9n-6
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
TOLUENE	2.6E+05	1.8E+08	5.7E+04	4.6E+04	1.2E-06	5.3E-06	6.5E-06	0.0E+00	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

2.39 SITE NCSA-9o: SECTION 35 - ARSENIC DETECTION (formerly Section 35-Uncontaminated; ESE, 1987m/RIC 87313R01; Section 35-Nonsource Area; ESE, 1988t/RIC 87313R01A)

2.39.1 Site-Specific Considerations

Figure NCSA-9o-1 and Tables NCSA-9o-1 and NCSA-9o-2 depict the target contaminants for Site NCSA-9o. Borings 4045 and 4135 through 4137 were included in this exposure assessment, consistent with the North Plants SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9o (ESE, 1987m/RIC 87313R01).

2.39.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9o are shown in Figure NCSA-9o-1. Table NCSA-9o-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9o-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.39.3 Site Exposure Summary

Tables NCSA-9o-3 through NCSA-9o-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9o is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

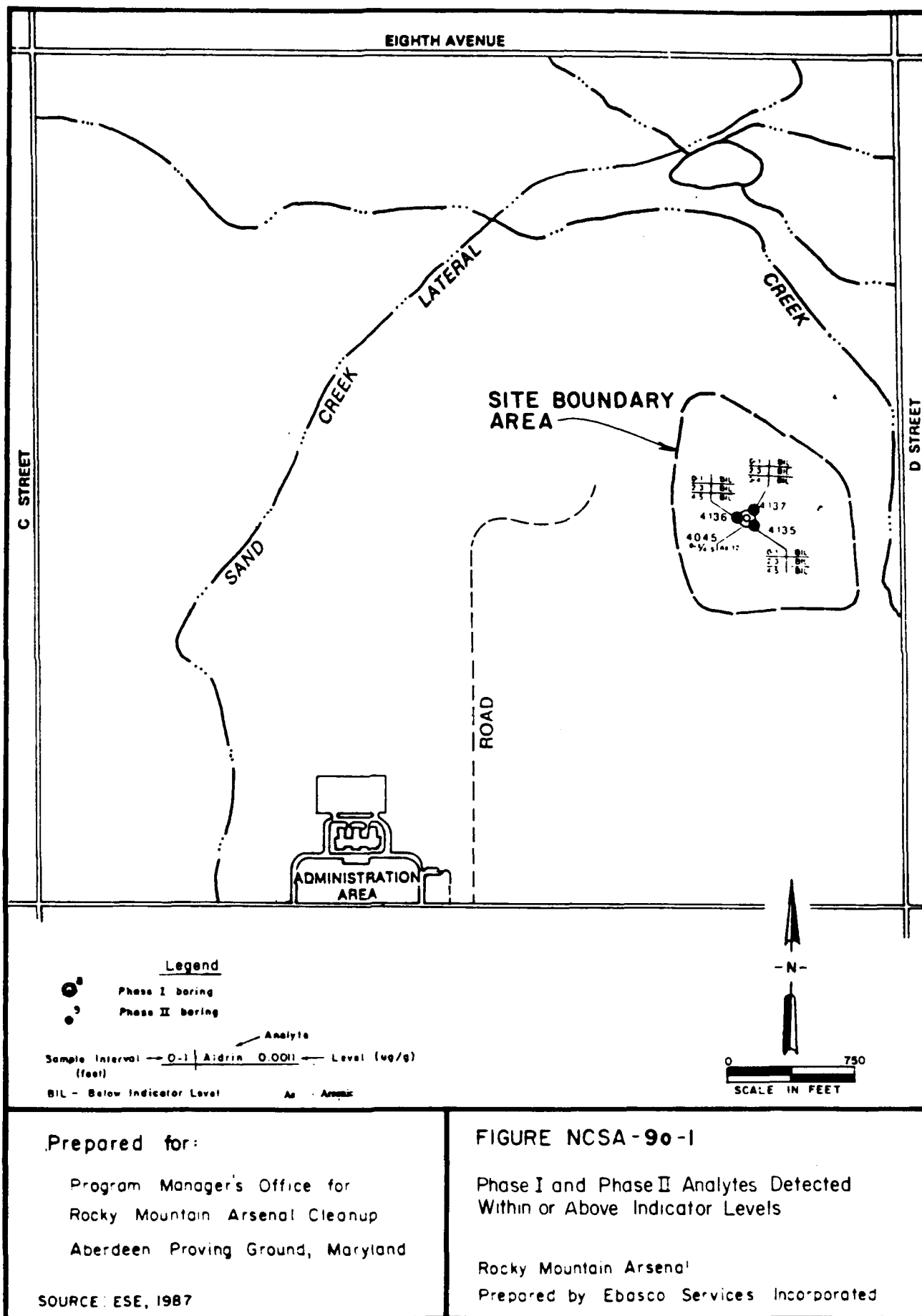
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Arsenic	Direct	Direct	Direct	Direct	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-90 is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminant results in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Chloroform (enclosed)



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland

SOURCE: ESE, 1987

FIGURE NCSA-90-1

Phase I and Phase II Analytes Detected
Within or Above Indicator Levels

Rocky Mountain Arsenal
Prepared by Ebasco Services Incorporated

TABLE NCSA-90-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-90

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Arsenic	12	Comp ^{1/} 0-1, 4-5	4045	--	--	--

1/ Comp Composite sample from 0-1 ft and 4-5 ft depth intervals.

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-90-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-90
AVERAGE SITE DEPTH TO GROUNDWATER: 13 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	1.8	35023	02/3/88
ALDRIN	0.066	35023	12/9/88
CARBON TETRACHLORIDE	1.3	35023	02/3/88
CHLOROFORM	1700	35023	12/9/88
HEXACHLOROCYCLOPENTADIENE	0.22	35023	12/9/88
CHLORDANE	0.53	35023	12/9/88
CHLOROPHENYLMETHYL SULFOXIDE	22	35023	02/3/88
CHLOROPHENYLMETHYL SULFONE	21	35023	12/9/88
DIBROMOCHLOROPROPANE	6.3	35023	12/9/88
DIISOPROPYLMETHYL PHOSPHONATE	1.8	35023	12/9/88
ENDRIN	0.12	35023	02/3/88
PARATHION	9.8	35023	12/9/88
TETRACHLOROETHYLENE	4.7	35023	12/9/88
TRICHLOROETHYLENE	1.3	35023	12/9/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-90-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-09
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-07
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	6.6E-10
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-12
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.8E-12
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.4E-07
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-12
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-13
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-08
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-13
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	7.1E-08
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	3.6E-11
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.8E-08
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E-01*	0.0E+00	5.6E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-90-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-09
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-07
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	6.6E-10
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-06
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-12
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.8E-12
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	4.4E-07
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-12
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-13
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-08
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-13
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	7.1E-08
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	3.6E-11
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.8E-08
ARSENIC	2.2E+01	0.0E+00	2.2E+01	5.6E-01*	0.0E+00	5.6E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-90-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	2.7E-08
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-05
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-08
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-04
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-11
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-11
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	6.6E-06
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	8.8E-12
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-12
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	4.2E-07
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	2.3E-12
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-06
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-10
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	5.7E-07
ARSENIC	3.9E+00	0.0E+00	3.9E+00	3.0E+00*	0.0E+00	3.0E+00*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-9a-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	6.3E-04
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-01
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	3.0E+00
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-06
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-06
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-01
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-06
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-07
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	6.7E-02
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	3.7E-07
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-02
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	3.8E-05
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-02
ARSENIC	2.0E+01	0.0E+00	2.0E+01	6.0E-01*	0.0E+00	6.0E-01*	0.0E+00

*: EI is equal to or exceeds 1.0E-01

NCSA-9a-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMUL	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	1.4E-08	1.9E-03
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	5.6E-06	7.7E-01
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	5.0E-09	6.9E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.4E-05	8.9E+00
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-11	3.1E-06
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-11	6.0E-06
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-06	4.6E-01
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-11	1.4E-06
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-12	2.2E-07
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	4.8E-07	6.7E-02
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.7E-12	3.7E-07
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	5.3E-07	7.3E-02
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	2.7E-10	3.8E-05
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-07	3.9E-02
ARSENIC	1.6E+00	0.0E+00	0.0E+00	1.6E+00	7.4E+00*	0.0E+00	7.4E+00*	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.40 SITE NCSA-9p: SECTION 36 - ARSENIC AND MERCURY DETECTIONS
(formerly Site 36-7: Solid Waste Burial/Sanitary Pit; ESE, 1988f/RIC 88063R07
and ESE, 1988bb/RIC 88063R07A; Site 36-5: Mercury Spill; ESE, 1988cc/RIC
88063R01)

2.40.1 Site-Specific Considerations

Figure NCSA-9p-1 and Tables NCSA-9p-1 and NCSA-9p-2 depict the target contaminants for Site NCSA-9p. Borings 3124 and 3125 were included in this exposure assessment, consistent with the North Plants SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9p (ESE, 1988f/RIC 88063R07).

2.40.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9p are shown in Figure NCSA-9p-1. Table NCSA-9p-1 shows that no target contaminants were found above the indicator level. Arsenic and mercury were detected in soils below 10 ft (in Horizon 2). However, they were not included in this exposure assessment and are not shown in Table NCSA-9p-1 since direct soil exposure of these compounds below 10 ft is assumed to be negligible (see Volume VI-A). Table NCSA-9p-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.40.3 Site Exposure Summary

Tables NCSA-9p-3 through NCSA-9p-7 present Draft PPLVs and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9p is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity.

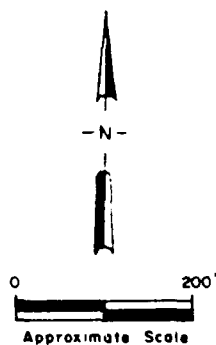
No soil contaminants are shown on Table NCSA-9p-1, therefore, no COCs were identified for this site. Site NCSA-9p is designated as a Priority 2 site.

No groundwater contaminants result in an unacceptable exposure due to vapor inhalation as indicated by VEI values less than 1.

0-1	Pb	25
	As	5.8
4-5	BIL	
9-10	As	7.5
14-15	Cu	49
	Pb	31
	Zn	98
	As	10
	Hg	0.070
19-20	Cu	81
	Pb	33
	As	17
	Hg	0.16



0-1	Hg	0.070
4-5	As	6.6
9-10	As	5.5
	Hg	0.050



Legend

- Site Boundary
- ⊙ Phase I Boring

Sample Interval — 0-1 Hg 0.17-Level (ug/p)
 4-5 PPDE 0.0096
 7-8 Bedrock sample

BIL - Below Indicator Level

As - Arsenic
 Cu - Copper
 Pb - Lead
 Hg - Mercury
 Zn - Zinc

Prepared for:

Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland

FIGURE NCSA-9p-1

Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels

Rocky Mountain Arsenal

Prepared by: Ebasco Services Incorporated

TABLE NCSA-9p-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9p

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
None	--	--	--	--	--	--
NCSA Max. ug/g ft	North Central Study Area Maximum microgram per gram foot/feet					

TABLE NCSA-9p-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9p
AVERAGE SITE DEPTH TO GROUNDWATER: 35 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
BENZOTHAZOLE	16	36112	02/11/88
CHLOROFORM	0.64	36112	02/11/88
CHLOROPHENYLMETHYL SULFOXIDE	73	36112	02/11/88
DIBROMOCHLOROPROPANE	0.45	36112	02/11/88
DITHIANE	350	36112	02/11/88
DIMETHYL DISULFIDE	1.0	36112	02/11/88
1,4-OXATHIANE	44	36112	02/11/88
TRICHLOROETHYLENE	0.62	36112	02/11/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

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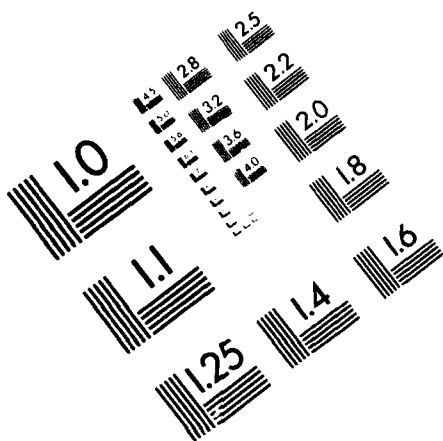
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ARSENAL STUDY AREA EU (U) BRASCO ENVIRONMENTAL
LAKEWOOD CO SEP 90 RMA-98277R01 DAAL5-88-D-0024

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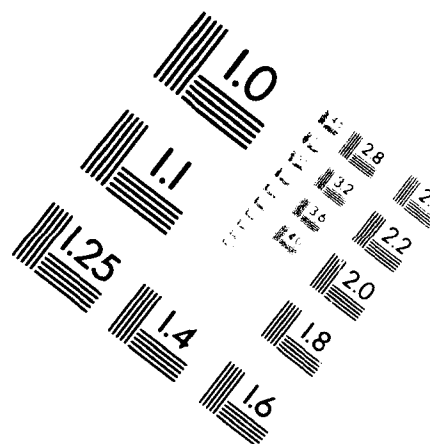
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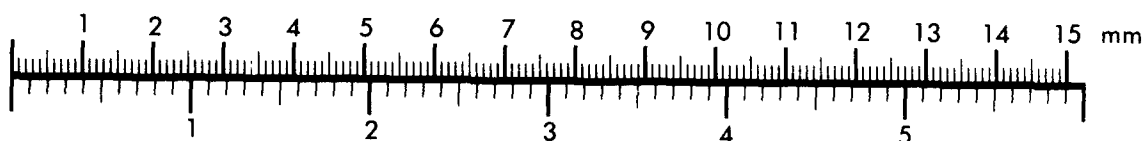
AIM

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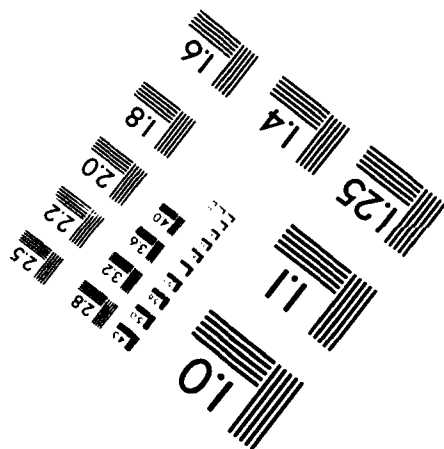
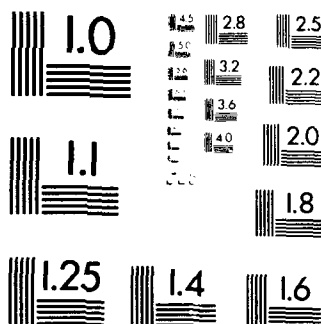
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910
301/587-8202



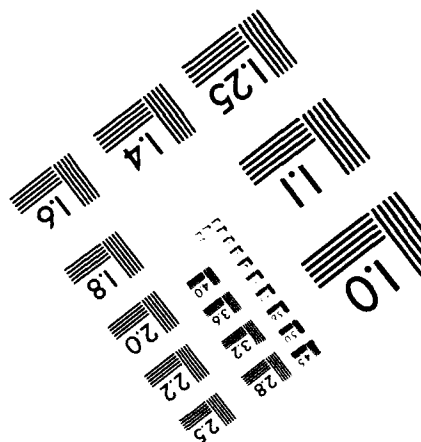
Centimeter



Inches



MANUFACTURED TO AIM STANDARDS
BY APPLIED IMAGE, INC.



NCSA-9p-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	3.7E-10
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	5.3E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-11
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-08
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	5.2E-10
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-08

NCSA-9p-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	3.7E-10
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	5.3E-09
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	3.2E-11
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-08
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	5.2E-10
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	3.0E-08

NCSA-9p-5

EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV	PPLV	PPLV	EI	EI	EI	OPN
	(mg/kg)	(mg/kg)	(mg/kg)				
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-09
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	7.9E-08
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-10
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	7.7E-07
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-09
DITHIANE	3.5E+04	0.0E+00	3.5E+04	1.0E+00	0.0E+00	0.0E+00	0.0E+00
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	4.5E-07

NCSA-9p-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.2E-05
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-04
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-06
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-03
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	4.5E-05
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-04

NCSA-9p-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.7E-09	3.2E-05
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	3.9E-08	4.5E-04
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.4E-10	2.8E-06
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-07	4.4E-03
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-09	4.5E-05
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-07	2.6E-03

2.41 SITE NCSA-9q: MERCURY DETECTION (formerly Site 36-10: Pit; ESE, 1988g/RIC88033R02)

2.41.1 Site-Specific Considerations

Figure NCSA-9q-1 and Tables NCSA-9q-1 and NCSA-9q-2 depict the target contaminants for Site NCSA-9q. Boring 3147 was included in this exposure assessment, consistent with the North Plants SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9q (ESE, 1988g/RIC 88033R02).

2.41.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9q are shown in Figure NCSA-9q-1. Table NCSA-9q-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9q-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.41.3 Site Exposure Summary

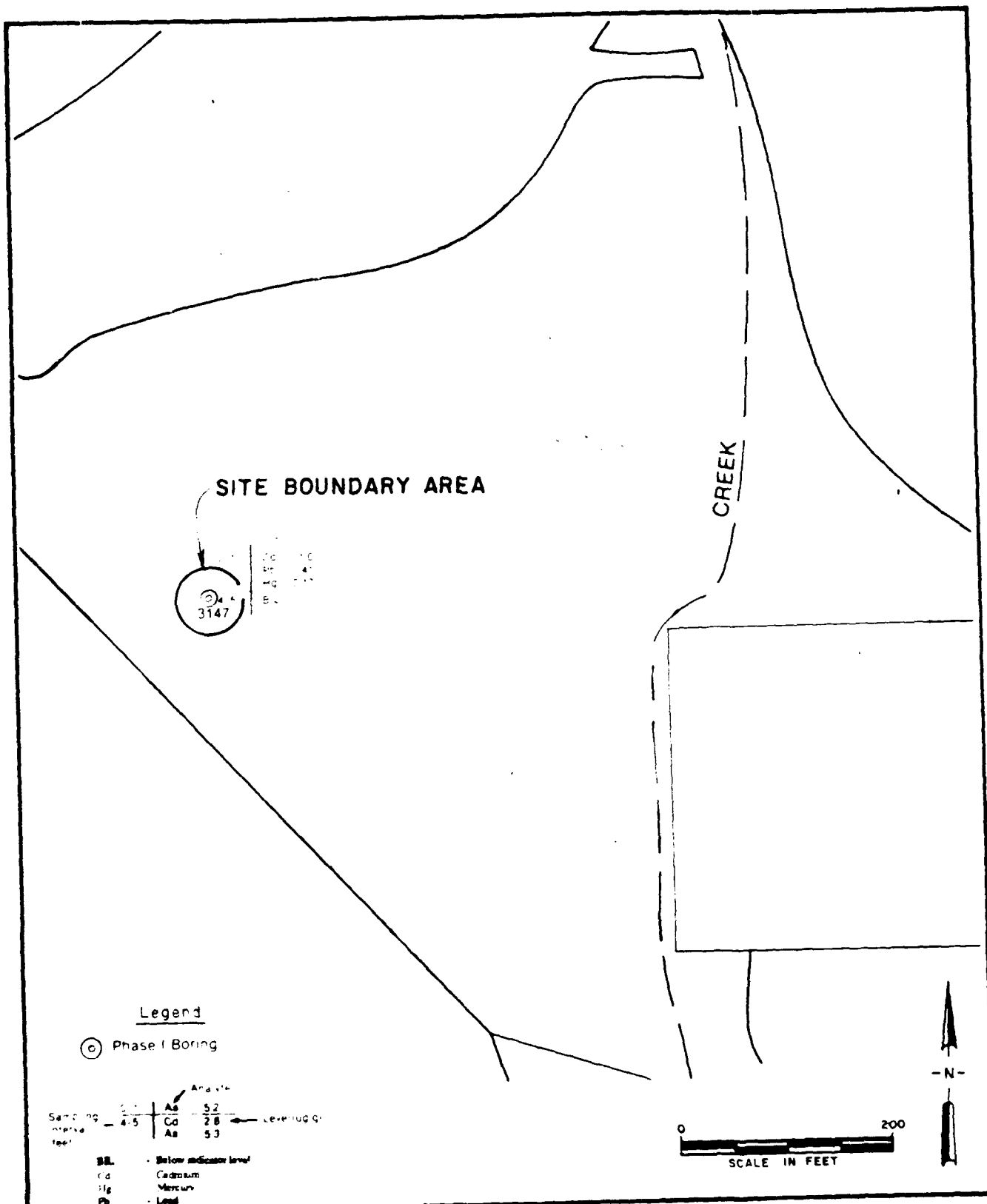
Tables NCSA-9q-3 through NCSA-9q-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9q is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual V.sitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9q is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminants appear to result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (enclosed)
- Carbon tetrachloride (enclosed)
- Chlorobenzene (enclosed)
- Chloroform (enclosed)
- Dibromochloropropane (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Dicyclopentadiene (enclosed)
- Methylene chloride (enclosed)
- Tetrachloroethylene (enclosed)
- Trichloroethylene (enclosed)



Prepared for:

Program Manager's Office for
Rocky Mountain Arsenal Cleanup
Aberdeen Proving Ground, Maryland
Source: ESE, 1987

FIGURE NCSA-9q-1
Phase I and Phase II Analytes Detected
Within or Above Indicator Levels
Rocky Mountain Arsenal
Prepared by: Ebasco Services Incorporated

TABLE NCSA-9q-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9q

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Lead	41	0-1	3147	--	--	--
Mercury	0.17	0-1	3147	--	--	--

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foot/feet

TABLE NCSA-9q-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9q

AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	2200	36001	01/5/89
1,1,2-TRICHLOROETHANE	150	36181	05/10/88
1,1-DICHLOROETHYLENE	8.0	36001	02/11/88
1,1-DICHLOROETHANE	6.3	36076	02/8/88
1,2-DICHLOROETHYLENE	280	36181	01/5/89
M-XYLENE	510	36001	02/11/88
ALDRIN	6.3	36001	02/11/88
ATRAZINE	GT 180	36001	02/11/88
BICYCLOHEPTADIENE	390	36001	01/5/89
BENZOTHIAZOLE	6.6	36001	01/5/89
BENZENE	51000	36181	05/10/88
CARBON TETRACHLORIDE	540	36181	01/5/89
METHYLENE CHLORIDE	33000	36076	01/6/89
CHLOROFORM	30000	36076	01/6/89
HEXACHLOROCYCLOPENTADIENE	4.4	36001	01/5/89
CHLOROBENZENE	70000	36181	05/10/88
CHLORDANE	5.7	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9q-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9q
AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROPHENYLMETHYL SULFIDE	110	36001	02/11/88
CHLOROPHENYLMETHYL SULFOXIDE	3.7	36181	10/28/87
CHLOROPHENYLMETHYL SULFONE	1300	36076	01/6/89
DIBROMOCHLOROPROPANE	GT 300	36001	01/5/89
DICYCLOPENTADIENE	92	36001	01/5/89
VAPONA	3.0	36076	01/6/89
DIISOPROPYLMETHYL PHOSPHONATE	15	36181	01/5/89
DITHIANE	GT 160	36076	02/8/88
DIELDRIN	1.2	36001	02/11/88
DIMETHYL DISULFIDE	67	36001	01/5/89
DIMETHYLMETHYL PHOSPHONATE	110	36181	10/28/87
ENDRIN	14	36001	01/5/89
ETHYLBENZENE	640	36001	02/11/88
ISODRIN	0.55	36076	01/6/89
TOLUENE	1300	36181	05/10/88
METHYLISOBUTYL KETONE	3500	36001	02/11/88
MALATHION	5.6	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9q-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9q

AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,4-OXATHIANE	54	36076	01/6/89
PPDDE	0.17	36076	01/6/89
PPDDT	0.98	36076	01/6/89
PARATHION	15	36001	01/5/89
SUPONA	18	36001	01/5/89
TETRACHLOROETHYLENE	310	36001	01/5/89
TRICHLOROETHYLENE	7600	36181	05/10/88
O,P-XYLENE	1100	36181	05/10/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9q-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPM
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	8.8E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	8.7E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.4E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-04
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-05
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	7.7E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.2E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.1E-13
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.2E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	9.2E-09
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.0E-11
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-05
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-06
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-12
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	7.6E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-15
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-09
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-06
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	3.4E-09
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	9.9E-07
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-11
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	8.3E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.8E-08
LEAD	1.5E+04	0.0E+00	1.5E+04	2.7E-03	0.0E+00	2.7E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.1E-05	0.0E+00	5.1E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9q-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	8.8E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.0E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	8.7E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.4E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-04
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	3.7E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-05
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	7.7E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	9.2E-11
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.1E-13
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.2E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	9.2E-09
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.1E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.0E-11
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-05
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	4.8E-06
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-12
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	7.6E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.1E-11
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-11
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	3.9E-05
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-06
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	3.4E-09
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.3E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	9.9E-07
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-11
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	8.3E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	1.8E-08
LEAD	1.5E+04	0.0E+00	1.5E+04	2.7E-03	0.0E+00	2.7E-03	0.0E+00
MERCURY	3.3E+03	0.0E+00	3.3E+03	5.1E-05	0.0E+00	5.1E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9q-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	1.3E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	6.7E-14
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-02
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-10
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	3.5E-07
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-03
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-08
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	6.6E-05
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.2E-03
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-09
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-10
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-12
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	3.3E-09
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-07
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-04
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	4.5E-10
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-04
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-05
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	7.1E-09
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.8E-11
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	6.8E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-11
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	4.9E-08
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	4.2E-06
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-09
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	2.8E-14
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.5E-08
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-03
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	1.8E-12
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	7.1E-14
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-05
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	2.2E-08
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-07
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-05
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.7E-03
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-10
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	5.4E-08
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	1.2E-07
LEAD	9.2E+03	0.0E+00	9.2E+03	4.4E-03	0.0E+00	4.4E-03	0.0E+00
MERCURY	2.0E+03	0.0E+00	2.0E+03	8.6E-05	0.0E+00	8.6E-05	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9q-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-02
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.2E+02
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-02
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	4.0E+01
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	7.7E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.9E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	6.9E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-07
PPDDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-03
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.7E+00
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-06
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	7.8E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.6E+00
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-04
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-06
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	8.0E-03
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-06
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-03
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.9E-01
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-09
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	2.9E-03
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-07
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	8.3E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	6.0E-01
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	2.6E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-02
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-01
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	4.7E-06
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	6.2E-03
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-02
LEAD	6.5E+03	0.0E+00	6.5E+03	6.3E-03	0.0E+00	6.3E-03	0.0E+00
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.2E-04	0.0E+00	1.2E-04	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9q-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	6.6E-07	6.6E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	7.8E-14	7.8E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	6.6E-03	6.6E+02
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-10	3.6E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	4.0E-07	4.0E-02
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-03	1.2E+02
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-08	2.7E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	7.7E-05	7.7E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	5.8E-04	5.8E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-09	4.9E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	6.9E-10	6.9E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-12	3.8E-07
PPDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-09	1.6E-04
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	6.9E-08	6.9E-03
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	8.0E-05	8.0E+00
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.2E-10	2.2E-05
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-04	2.3E+01
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	3.6E-05	3.6E+00
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	3.5E-09	3.5E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-11	4.4E-06
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	7.9E-08	8.0E-03
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	9.9E-11	9.9E-06
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	5.7E-08	5.7E-03
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-06	4.9E-01
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-09	2.3E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-14	3.3E-09
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	2.9E-08	2.9E-03
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	8.5E-04	8.5E+01
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.1E-12	2.1E-07
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	8.3E-14	8.3E-09
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	1.8E-05	1.8E+00
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	2.5E-08	2.6E-03
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-07	1.7E-02
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	7.4E-06	7.4E-01
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	8.5E-04	8.5E+01
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-10	1.4E-05
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	6.2E-08	6.2E-03
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.3E-07	1.3E-02
LEAD	2.2E+03	0.0E+00	0.0E+00	2.2E+03	1.9E-02	0.0E+00	1.9E-02	0.0E+00	0.0E+00
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	3.7E-04	0.0E+00	3.7E-04	0.0E+00	0.0E+00

2.42 SITE NCSA-9r: CADMIUM DETECTION (formerly Site 36-10: Pit; ESE, 1988g/RIC88033R02)

2.42.1 Site-Specific Considerations

Figure NCSA-9r-1 and Tables NCSA-9r-1 and NCSA-9r-2 depict the target contaminants for Site NCSA-9r. Boring 3144 was included in this exposure assessment, consistent with the North Plants SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9r (ESE, 1988g/RIC 88033R02).

2.42.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminant that was detected in Site NCSA-9r are shown in Figure NCSA-9r-1. Table NCSA-9r-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9r-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.42.3 Site Exposure Summary

Tables NCSA-9r-3 through NCSA-9r-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9r is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

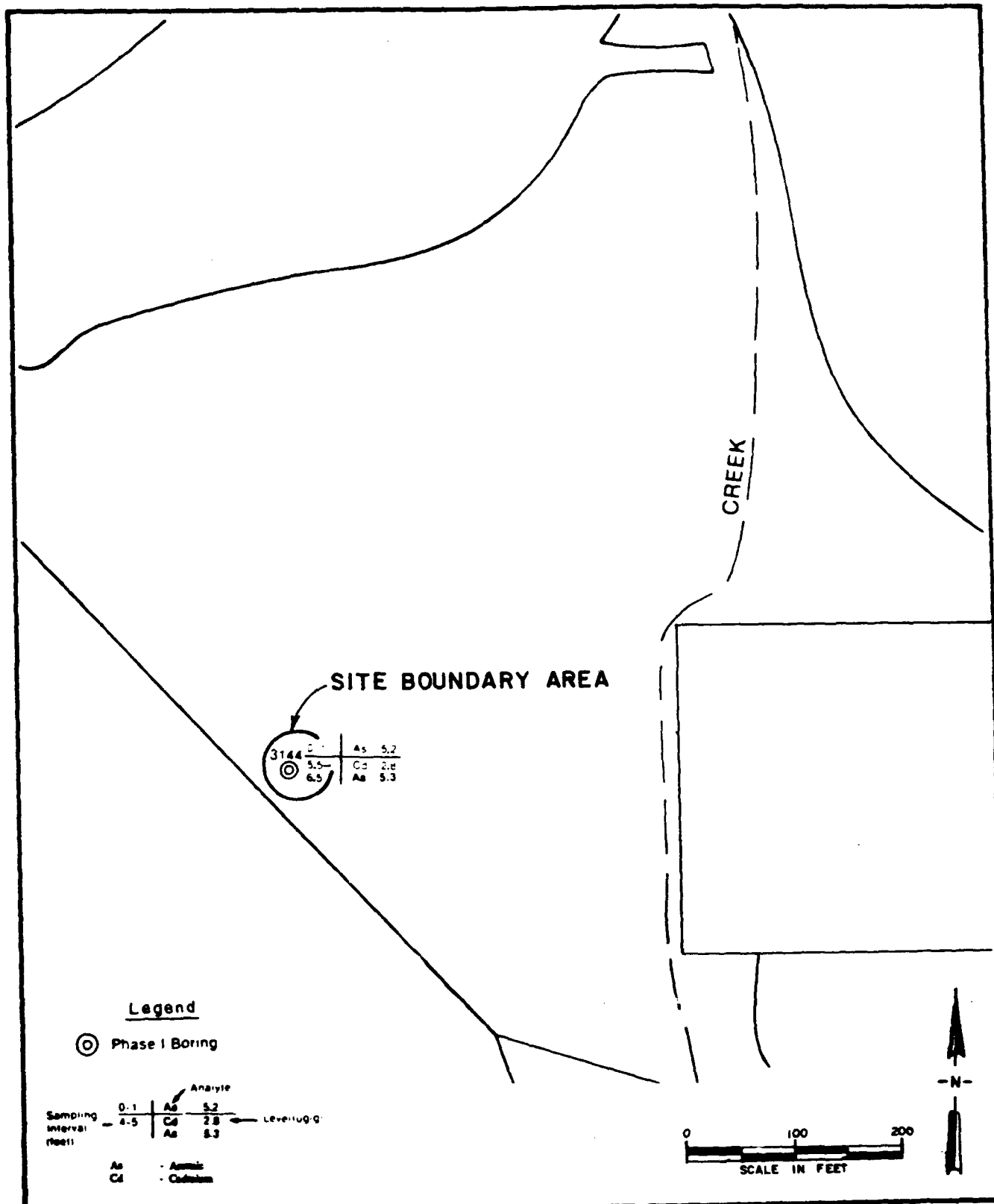
Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
Cadmium	--	--	--	--	Direct

Note: Direct exposure pathways for soils include soil ingestion, suspended particulate inhalation, and dermal contact.

The results of the soil exposure summary indicate that exposure to contamination from the direct pathways are the primary contributors to the exceedance of the cumulative PPLVs. Site NCSA-9r is designated as a Priority 1 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following contaminants result in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Benzene (enclosed)
- Carbon tetrachloride (enclosed)
- Chlorobenzene (enclosed)
- Chloroform (enclosed)
- Dibromochloropropane (enclosed)
- 1,1-Dichloroethylene (enclosed)
- Dicyclopentadiene (enclosed)
- Methylene chloride (enclosed)
- Trichloroethylene (enclosed)



Prepared for:
 Program Manager's Office for
 Rocky Mountain Arsenal Cleanup
 Aberdeen Proving Ground, Maryland
 Source: ESE, 1987

FIGURE NCSA-9r-1
 Phase I and Phase II Analytes Detected
 Within or Above Indicator Levels
 Rocky Mountain Arsenal
 Prepared by: Ebasco Services Incorporated

TABLE NCSA-9r-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-5r

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Cadmium	2.8	5.5-6.5	3144	--	--	--
NCSA Max. ug/g ft	North Central Study Area Maximum microgram per gram foot/feet					

TABLE NCSA-9r-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9r

AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet.

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	2200	36001	01/5/89
1,1,2-TRICHLOROETHANE	150	36181	05/10/88
1,1-DICHLOROETHYLENE	8.0	36001	02/11/88
1,1-DICHLOROETHANE	6.3	36076	02/8/88
1,2-DICHLOROETHYLENE	280	36181	01/5/89
M-XYLENE	510	36001	02/11/88
ALDRIN	6.3	36001	02/11/88
ATRAZINE	GT 180	36001	02/11/88
BICYCLOHEPTADIENE	390	36001	01/5/89
BENZOTHIAZOLE	6.6	36001	01/5/89
BENZENE	51000	36181	05/10/88
CARBON TETRACHLORIDE	540	36181	01/5/89
METHYLENE CHLORIDE	33000	36076	01/6/89
CHLOROFORM	30000	36076	01/6/89
HEXACHLOROCYCLOPENTADIENE	4.4	36001	01/5/89
CHLOROBENZENE	70000	36181	05/10/88
CHLORDANE	5.7	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9r-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9r
AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
CHLOROPHENYLMETHYL SULFIDE	110	36001	02/11/88
CHLOROPHENYLMETHYL SULFOXIDE	3.7	36181	10/28/87
CHLOROPHENYLMETHYL SULFONE	1300	36076	01/6/89
DIBROMOCHLOROPROPANE	GT 300	36001	01/5/89
DICYCLOPENTADIENE	92	36001	01/5/89
VAPONA	3.0	36076	01/6/89
DIISOPROPYLMETHYL PHOSPHONATE	15	36181	01/5/89
DITHIANE	GT 160	36076	02/8/88
DIELDRIN	1.2	36001	02/11/88
DIMETHYL DISULFIDE	67	36001	01/5/89
DIMETHYLMETHYL PHOSPHONATE	110	36181	10/28/87
ENDRIN	14	36001	01/5/89
ETHYLBENZENE	640	36001	02/11/88
ISODRIN	0.55	36076	01/6/89
TOLUENE	1300	36181	05/10/88
METHYLISOBUTYL KETONE	3500	36001	02/11/88
MALATHION	5.6	36076	01/6/89

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

TABLE NCSA-9r-2
GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9r

AVERAGE SITE DEPTH TO GROUNDWATER: 19 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,4-OXATHIANE	54	36076	01/6/89
PPDDE	0.17	36076	01/6/89
PPDDT	0.98	36076	01/6/89
PARATHION	15	36001	01/5/89
SUPONA	18	36001	01/5/89
TETRACHLOROETHYLENE	310	36001	01/5/89
TRICHLOROETHYLENE	7600	36181	05/10/88
O,P-XYLENE	1100	36181	05/10/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYTE
FOR THE PERIOD March 17, 1987 TO February 28, 1989.
DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9r-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	9.7E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	9.6E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-04
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	4.0E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-05
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.2E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.6E-13
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.0E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.2E-11
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-05
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-06
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-12
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-08
DIMETHYLMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	8.4E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.1E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.4E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.8E-15
METHYLSOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.3E-09
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.9E-08
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	3.7E-09
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.5E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-06
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-11
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	9.1E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.0E-08
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.2E-03	0.0E+00	6.2E-03	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-91-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	9.7E-08
ATRAZINE	4.1E+04	0.0E+00	4.1E+04	0.0E+00	0.0E+00	0.0E+00	1.1E-14
BENZENE	8.6E+02	0.0E+00	8.6E+02	0.0E+00	0.0E+00	0.0E+00	9.6E-04
BENZOTHAZOLE	3.9E+04	0.0E+00	3.9E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-11
BICYCLOHEPTADIENE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	5.9E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	1.8E-04
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	4.0E-09
CHLOROBENZENE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.1E-05
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	8.4E-05
CHLOROPHENYLMETHYL SULFIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	7.2E-10
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	5.6E-13
PPDDE	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-10
PPDDT	7.4E+01	0.0E+00	7.4E+01	0.0E+00	0.0E+00	0.0E+00	1.0E-08
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.2E-05
1,1-DICHLOROETHANE	2.8E+02	0.0E+00	2.8E+02	0.0E+00	0.0E+00	0.0E+00	3.2E-11
1,1-DICHLOROETHYLENE	4.3E+01	0.0E+00	4.3E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-05
1,2-DICHLOROETHYLENE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	5.4E+04	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	5.3E-06
DIELDRIN	1.6E+00	0.0E+00	1.6E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-10
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	6.5E-12
DIMETHYLDISULFIDE	6.7E+04	0.0E+00	6.7E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-08
DIMETHYMETHYL PHOSPHONATE	1.5E+05	0.0E+00	1.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.3E+04	0.0E+00	8.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	1.5E-11
ETHYLBENZENE	8.3E+05	0.0E+00	8.3E+05	0.0E+00	0.0E+00	0.0E+00	8.4E-09
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.1E-07
ISODRIN	5.8E+02	0.0E+00	5.8E+02	0.0E+00	0.0E+00	0.0E+00	3.4E-10
MALATHION	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	4.8E-15
METHYLISOBUTYL KETONE	4.1E+05	0.0E+00	4.1E+05	0.0E+00	0.0E+00	0.0E+00	4.3E-09
METHYLENE CHLORIDE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-04
1,4-OXATHIANE	2.5E+05	0.0E+00	2.5E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	3.0E-13
SUPONA	1.2E+03	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-14
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	3.9E-08
TOLUENE	2.5E+06	0.0E+00	2.5E+06	0.0E+00	0.0E+00	0.0E+00	3.7E-09
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	2.5E-08
1,1,2-TRICHLOROETHANE	4.3E+02	0.0E+00	4.3E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-06
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.2E-04
VAPONA	8.6E+01	0.0E+00	8.6E+01	0.0E+00	0.0E+00	0.0E+00	2.1E-11
M-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	9.1E-09
O,P-XYLENE	1.4E+07	0.0E+00	1.4E+07	0.0E+00	0.0E+00	0.0E+00	2.0E-08
CADMIUM	4.5E+02	0.0E+00	4.5E+02	6.2E-03	0.0E+00	6.2E-03	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9r-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	1.5E-06
ATRAZINE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	7.4E-14
BENZENE	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	1.4E-02
BENZOTHAZOLE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-10
BICYCLOHEPTADIENE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	3.8E-07
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	2.6E-03
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	6.0E-08
CHLOROBENZENE	6.8E+04	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	7.3E-05
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	1.3E-03
CHLOROPHENYLMETHYL SULFIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	4.6E-09
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.5E-10
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-12
PPDDE	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-09
PPDDT	1.0E+01	0.0E+00	1.0E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-07
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-04
1,1-DICHLOROETHANE	3.9E+01	0.0E+00	3.9E+01	0.0E+00	0.0E+00	0.0E+00	4.9E-10
1,1-DICHLOROETHYLENE	5.9E+00	0.0E+00	5.9E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-04
1,2-DICHLOROETHYLENE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.8E+04	0.0E+00	1.8E+04	0.0E+00	0.0E+00	0.0E+00	3.4E-05
DIELDRIN	2.2E-01	0.0E+00	2.2E-01	0.0E+00	0.0E+00	0.0E+00	7.8E-09
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	4.2E-11
DIMETHYLDISULFIDE	2.9E+04	0.0E+00	2.9E+04	0.0E+00	0.0E+00	0.0E+00	7.5E-08
DIMETHYLMETHYL PHOSPHONATE	6.3E+04	0.0E+00	6.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	3.5E+04	0.0E+00	3.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	9.4E-11
ETHYLBENZENE	3.5E+05	0.0E+00	3.5E+05	0.0E+00	0.0E+00	0.0E+00	5.4E-08
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	4.6E-06
ISODRIN	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-09
MALATHION	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-14
METHYLISOBUTYL KETONE	1.7E+05	0.0E+00	1.7E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-08
METHYLENE CHLORIDE	4.5E+02	0.0E+00	4.5E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-03
1,4-OXATHIANE	1.1E+05	0.0E+00	1.1E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-12
SUPONA	5.3E+02	0.0E+00	5.3E+02	0.0E+00	0.0E+00	0.0E+00	7.8E-14
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	5.9E-07
TOLUENE	1.1E+06	0.0E+00	1.1E+06	0.0E+00	0.0E+00	0.0E+00	2.4E-08
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	1.6E-07
1,1,2-TRICHLOROETHANE	6.0E+01	0.0E+00	6.0E+01	0.0E+00	0.0E+00	0.0E+00	1.6E-05
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	1.9E-03
VAPONA	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-10
M-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	5.9E-08
O,P-XYLENE	5.8E+06	0.0E+00	5.8E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-07
CADMIUM	5.8E+01	0.0E+00	5.8E+01	4.8E-02	0.0E+00	4.8E-02	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9r-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-02
ATRAZINE	2.3E+04	0.0E+00	2.3E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-09
BENZENE	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	2.2E+02
BENZOTHAZOLE	2.2E+04	0.0E+00	2.2E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-05
BICYCLOHEPTADIENE	1.8E+05	0.0E+00	1.8E+05	0.0E+00	0.0E+00	0.0E+00	4.0E-02
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	4.0E+01
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	9.1E-04
CHLOROBENZENE	8.8E+04	0.0E+00	8.8E+04	0.0E+00	0.0E+00	0.0E+00	7.7E+00
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	1.9E+01
CHLOROPHENYLMETHYL SULFIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-04
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	6.9E-05
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.8E-07
PPDDE	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-05
PPDDT	9.3E+01	0.0E+00	9.3E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-03
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.7E+00
1,1-DICHLOROETHANE	3.6E+02	0.0E+00	3.6E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-06
1,1-DICHLOROETHYLENE	5.4E+01	0.0E+00	5.4E+01	0.0E+00	0.0E+00	0.0E+00	7.8E+00
1,2-DICHLOROETHYLENE	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.6E+00
DIELDRIN	2.0E+00	0.0E+00	2.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-04
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	4.4E-06
DIMETHYLDISULFIDE	3.7E+04	0.0E+00	3.7E+04	0.0E+00	0.0E+00	0.0E+00	8.0E-03
DIMETHYLMETHYL PHOSPHONATE	8.2E+04	0.0E+00	8.2E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	4.6E+04	0.0E+00	4.6E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	9.9E-06
ETHYLBENZENE	4.6E+05	0.0E+00	4.6E+05	0.0E+00	0.0E+00	0.0E+00	5.7E-03
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	4.9E-01
ISODRIN	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.3E-04
MALATHION	9.2E+04	0.0E+00	9.2E+04	0.0E+00	0.0E+00	0.0E+00	3.3E-09
METHYLISOBUTYL KETONE	2.2E+05	0.0E+00	2.2E+05	0.0E+00	0.0E+00	0.0E+00	2.9E-03
METHYLENE CHLORIDE	4.1E+03	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
1,4-OXATHIANE	1.4E+05	0.0E+00	1.4E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	2.1E-07
SUPONA	6.9E+02	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	8.3E-09
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	9.0E-03
TOLUENE	1.4E+06	0.0E+00	1.4E+06	0.0E+00	0.0E+00	0.0E+00	2.6E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	1.7E-02
1,1,2-TRICHLOROETHANE	5.5E+02	0.0E+00	5.5E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-01
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	2.8E+01
VAPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	4.7E-06
M-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	6.2E-03
O,P-XYLENE	7.0E+06	0.0E+00	7.0E+06	0.0E+00	0.0E+00	0.0E+00	1.3E-02
CADMIUM	3.6E+02	0.0E+00	3.6E+02	7.8E-03	0.0E+00	7.8E-03	0.0E+00

If the PPLV value indicated is greater than 1.00E+06 the calculations imply that the contaminant does not pose unacceptable chronic exposure through the exposure pathway considered, even in its pure form.

NCSA-9r-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	7.3E-07	6.6E-02
ATRAZINE	4.2E+03	0.0E+00	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	8.6E-14	7.8E-09
BENZENE	6.7E+01	0.0E+00	0.0E+00	6.7E+01	0.0E+00	0.0E+00	0.0E+00	7.2E-03	6.6E+02
BENZOTHAZOLE	4.0E+03	0.0E+00	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	3.9E-10	3.6E-05
BICYCLOHEPTADIENE	3.3E+04	0.0E+00	0.0E+00	3.3E+04	0.0E+00	0.0E+00	0.0E+00	4.4E-07	4.0E-02
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	1.3E-03	1.2E+02
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-08	2.7E-03
CHLOROBENZENE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	8.5E-05	7.7E+00
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	6.3E-04	5.8E+01
CHLOROPHENYLMETHYL SULFIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	5.4E-09	4.9E-04
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.6E-10	6.9E-05
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	4.2E-12	3.8E-07
PPDDE	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-09	1.6E-04
PPDDT	5.7E+00	0.0E+00	0.0E+00	5.7E+00	0.0E+00	0.0E+00	0.0E+00	7.6E-08	6.9E-03
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-05	8.0E+00
1,1-DICHLOROETHANE	2.3E+01	0.0E+00	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	2.4E-10	2.2E-05
1,1-DICHLOROETHYLENE	3.2E+00	0.0E+00	0.0E+00	3.2E+00	0.0E+00	0.0E+00	0.0E+00	2.6E-04	2.3E+01
1,2-DICHLOROETHYLENE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DICYCLOPENTADIENE	1.2E+03	0.0E+00	0.0E+00	1.2E+03	0.0E+00	0.0E+00	0.0E+00	4.0E-05	3.6E+00
DIELDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	3.9E-09	3.5E-04
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	4.9E-11	4.4E-04
DIMETHYLDISULFIDE	6.9E+03	0.0E+00	0.0E+00	6.9E+03	0.0E+00	0.0E+00	0.0E+00	8.7E-08	8.0E-03
DIMETHYLMETHYL PHOSPHONATE	1.5E+04	0.0E+00	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
DITHIANE	8.5E+03	0.0E+00	0.0E+00	8.5E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	1.1E-10	9.9E-04
ETHYLBENZENE	8.5E+04	0.0E+00	0.0E+00	8.5E+04	0.0E+00	0.0E+00	0.0E+00	6.3E-08	5.7E-01
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	5.3E-06	4.9E-01
ISODRIN	5.9E+01	0.0E+00	0.0E+00	5.9E+01	0.0E+00	0.0E+00	0.0E+00	2.6E-09	2.3E-04
MALATHION	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	3.6E-14	3.3E-01
METHYL ISOBUTYL KETONE	4.0E+04	0.0E+00	0.0E+00	4.0E+04	0.0E+00	0.0E+00	0.0E+00	3.2E-08	2.9E-01
METHYLENE CHLORIDE	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	9.3E-04	8.5E+00
1,4-OXATHIANE	2.5E+04	0.0E+00	0.0E+00	2.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	2.3E-12	2.1E-01
SUPONA	1.3E+02	0.0E+00	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	9.1E-14	8.3E-01
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	2.9E-07	2.7E-01
TOLUENE	2.6E+05	0.0E+00	0.0E+00	2.6E+05	0.0E+00	0.0E+00	0.0E+00	2.8E-08	2.6E-01
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	1.9E-07	1.7E-01
1,1,2-TRICHLOROETHANE	3.4E+01	0.0E+00	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	8.1E-06	7.4E-01
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	9.3E-04	8.5E+00
VAPONA	6.7E+00	0.0E+00	0.0E+00	6.7E+00	0.0E+00	0.0E+00	0.0E+00	1.5E-10	1.4E-01
M-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	6.8E-08	6.2E-01
O,P-XYLENE	8.8E+05	0.0E+00	0.0E+00	8.8E+05	0.0E+00	0.0E+00	0.0E+00	1.5E-07	1.3E-01
CADMIUM	7.6E+00	0.0E+00	0.0E+00	7.6E+00	3.7E-01*	0.0E+00	3.7E-01*	0.0E+00	0.0E+00

*: EI is equal to or exceeds 1.0E-01

2.43 SITE NCSA-9s: SECTION 36 - MERCURY DETECTION (formerly Site 36-22:
Liquid Storage Pool; ESE, 1988h/RIC 88103R01)

2.43.1 Site-Specific Considerations

Figure NCSA-9s-1 and Tables NCSA-9s-1 and NCSA-9s-2 depict the target contaminants for Site NCSA-9s. Borings 3159 through 3162 and 3376 through 3378 were included in this exposure assessment, consistent with the North Plants SAR. According to site history, no chemicals from the RMA target contaminant list were suspected to be present in Site NCSA-9s (ESE, 1988h/RIC 88103R01).

2.43.2 Spatial Distribution of Measured Contaminant Concentrations

The locations and concentrations of the target contaminants that were detected in Site NCSA-9s are shown in Figure NCSA-9s-1. Table NCSA-9s-1 summarizes the maximum concentrations of contaminants measured in soil above indicator levels for the ICP metals, arsenic, and mercury from the Phase I and Phase II investigations. The boring number and depth where the maximum value was observed are shown. No data were included for ICP metals, arsenic, and mercury in Horizon 2 because direct soil exposure below 10 ft is assumed to be negligible (see Volume VI-A). No organic contaminants were detected at this location. Table NCSA-9s-2 summarizes the maximum concentrations detected in groundwater together with the well number, location, sampling interval, and depth to groundwater.

2.43.3 Site Exposure Summary

Tables NCSA-9s-3 through NCSA-9s-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. Since the depth to groundwater below Site NCSA-9s is greater than 10 ft, the enclosed space vapor inhalation SPPPLV is included in the calculation of the cumulative quantity. The COCs are summarized below for each exposed population and with the critical exposure pathway identified.

Contaminants of Concern	Regulated Visitor	Casual Visitor	Recreational Visitor	Commercial Worker	Industrial Worker
None	--	--	--	--	--

The results of the soil exposure summary indicate that there are no COCs. Site NCSA-9s is designated as a Priority 2 site, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

The following groundwater contaminant results in an unacceptable exposure due to vapor inhalation as indicated by a VEI value greater than 1:

- Chloroform (enclosed)



TABLE NCSA-9s-1
SOIL CONTAMINANT CONCENTRATIONS
FOR SITE NCSA-9s

Contaminant	Horizon 1			Horizon 2		
	Max. (ug/g)	Depth (ft)	Boring Number	Max. (ug/g)	Depth (ft)	Boring Number
Mercury	0.15	0-1	3376	--	--	--
		0-1	3378	--	--	--

NCSA
Max.
ug/g
ft

North Central Study Area
Maximum
microgram per gram
foo/feet

TABLE NCSA-9s-2

GROUNDWATER CONTAMINANT CONCENTRATIONS (UG/L)
FOR SITE NCSA-9s

AVERAGE SITE DEPTH TO GROUNDWATER: 13 Feet

CHEMICAL	CONCENTRATION MAXIMUM	LOCATION (WELL NUMBER)	SAMPLE DATE
1,1,1-TRICHLOROETHANE	1.8	35023	02/3/88
ALDRIN	0.066	35023	12/9/88
CARBON TETRACHLORIDE	1.3	35023	02/3/88
CHLOROFORM	1700	35023	12/9/88
HEXACHLOROCYCLOPENTADIENE	0.22	35023	12/9/88
CHLORDANE	0.53	35023	12/9/88
CHLOROPHENYLMETHYL SULFOXIDE	22	35023	02/3/88
CHLOROPHENYLMETHYL SULFONE	21	35023	12/9/88
DIBROMOCHLOROPROPANE	6.3	35023	12/9/88
DIISOPROPYLMETHYL PHOSPHONATE	1.8	35023	12/9/88
ENDRIN	0.12	35023	02/3/88
PARATHION	9.8	35023	12/9/88
TETRACHLOROETHYLENE	4.7	35023	12/9/88
TRICHLOROETHYLENE	1.3	35023	12/9/88

EACH VALUE PRESENTED IS THE MAXIMUM CONCENTRATION FOR THE LISTED ANALYT
FOR THE PERIOD March 17, 1987 TO February 28, 1989.

DATA SOURCE: DP ASSOCIATES, RMA Database, July 19, 1990

NCSA-9s-3
EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-05
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-04
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-10
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-05
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-11
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	7.4E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-06
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-11
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-06
MERCURY	3.3E+03	0.0E+00	3.3E+03	4.5E-05	0.0E+00	4.5E-05	0.0E+00

NCSA-9s-4
EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-08
CARBON TETRACHLORIDE	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	2.5E-05
CHLORDANE	2.0E+01	0.0E+00	2.0E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-08
CHLOROFORM	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	2.9E-04
CHLOROPHENYLMETHYL SULFONE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	1.0E-10
CHLOROPHENYLMETHYL SULFOXIDE	1.6E+05	0.0E+00	1.6E+05	0.0E+00	0.0E+00	0.0E+00	2.0E-10
DIBROMOCHLOROPROPANE	1.8E+01	0.0E+00	1.8E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-05
DIISOPROPYLMETHYL PHOSPHONATE	6.6E+05	0.0E+00	6.6E+05	0.0E+00	0.0E+00	0.0E+00	4.6E-11
ENDRIN	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	7.4E-12
HEXACHLOROCYCLOPENTADIENE	1.7E+04	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	2.2E-06
PARATHION	5.0E+04	0.0E+00	5.0E+04	0.0E+00	0.0E+00	0.0E+00	1.2E-11
TETRACHLOROETHYLENE	5.1E+02	0.0E+00	5.1E+02	0.0E+00	0.0E+00	0.0E+00	6.6E-07
1,1,1-TRICHLOROETHANE	7.5E+05	0.0E+00	7.5E+05	0.0E+00	0.0E+00	0.0E+00	1.2E-09
TRICHLOROETHYLENE	2.3E+03	0.0E+00	2.3E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-06
MERCURY	3.3E+03	0.0E+00	3.3E+03	4.5E-05	0.0E+00	4.5E-05	0.0E+00

NCSA-9s-5
EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	2.1E-01	0.0E+00	2.1E-01	0.0E+00	0.0E+00	0.0E+00	9.3E-07
CARBON TETRACHLORIDE	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	3.8E-04
CHLORDANE	2.7E+00	0.0E+00	2.7E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-07
CHLOROFORM	5.6E+02	0.0E+00	5.6E+02	0.0E+00	0.0E+00	0.0E+00	4.4E-03
CHLOROPHENYLMETHYL SULFONE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	6.6E-10
CHLOROPHENYLMETHYL SULFOXIDE	7.0E+04	0.0E+00	7.0E+04	0.0E+00	0.0E+00	0.0E+00	1.3E-09
DIBROMOCHLOROPROPANE	2.5E+00	0.0E+00	2.5E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-04
DIISOPROPYLMETHYL PHOSPHONATE	2.8E+05	0.0E+00	2.8E+05	0.0E+00	0.0E+00	0.0E+00	3.0E-10
ENDRIN	1.1E+03	0.0E+00	1.1E+03	0.0E+00	0.0E+00	0.0E+00	4.8E-11
HEXACHLOROCYCLOPENTADIENE	5.7E+03	0.0E+00	5.7E+03	0.0E+00	0.0E+00	0.0E+00	1.4E-05
PARATHION	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	7.8E-11
TETRACHLOROETHYLENE	7.1E+01	0.0E+00	7.1E+01	0.0E+00	0.0E+00	0.0E+00	1.0E-05
1,1,1-TRICHLOROETHANE	3.2E+05	0.0E+00	3.2E+05	0.0E+00	0.0E+00	0.0E+00	7.9E-09
TRICHLOROETHYLENE	3.2E+02	0.0E+00	3.2E+02	0.0E+00	0.0E+00	0.0E+00	2.0E-05
MERCURY	2.0E+03	0.0E+00	2.0E+03	7.6E-05	0.0E+00	7.6E-05	0.0E+00

NCSA-9s-6
EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT	CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI
	PPLV (mg/kg)	PPLV (mg/kg)	PPLV (mg/kg)	EI	EI	EI	ENC
ALDRIN	1.9E+00	0.0E+00	1.9E+00	0.0E+00	0.0E+00	0.0E+00	6.3E-04
CARBON TETRACHLORIDE	2.5E+02	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-01
CHLORDANE	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	2.3E-04
CHLOROFORM	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	3.0E+00
CHLOROPHENYLMETHYL SULFONE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-06
CHLOROPHENYLMETHYL SULFOXIDE	9.1E+04	0.0E+00	9.1E+04	0.0E+00	0.0E+00	0.0E+00	6.0E-06
DIBROMOCHLOROPROPANE	2.3E+01	0.0E+00	2.3E+01	0.0E+00	0.0E+00	0.0E+00	1.5E-01
DIISOPROPYLMETHYL PHOSPHONATE	3.7E+05	0.0E+00	3.7E+05	0.0E+00	0.0E+00	0.0E+00	1.4E-06
ENDRIN	1.4E+03	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-07
HEXACHLOROCYCLOPENTADIENE	5.5E+03	0.0E+00	5.5E+03	0.0E+00	0.0E+00	0.0E+00	6.7E-02
PARATHION	2.7E+04	0.0E+00	2.7E+04	0.0E+00	0.0E+00	0.0E+00	3.7E-07
TETRACHLOROETHYLENE	6.5E+02	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	6.8E-03
1,1,1-TRICHLOROETHANE	4.2E+05	0.0E+00	4.2E+05	0.0E+00	0.0E+00	0.0E+00	3.8E-05
TRICHLOROETHYLENE	2.9E+03	0.0E+00	2.9E+03	0.0E+00	0.0E+00	0.0E+00	1.3E-02
MERCURY	1.4E+03	0.0E+00	1.4E+03	1.1E-04	0.0E+00	1.1E-04	0.0E+00

NCSA-9s-7
EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.2E-01	0.0E+00	0.0E+00	1.2E-01	0.0E+00	0.0E+00	0.0E+00	4.6E-07	1.9E-03
CARBON TETRACHLORIDE	1.5E+01	0.0E+00	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	1.9E-04	7.7E-01
CHLORDANE	1.5E+00	0.0E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-07	6.9E-04
CHLOROFORM	3.1E+02	0.0E+00	0.0E+00	3.1E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-03	8.9E+00
CHLOROPHENYLMETHYL SULFONE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	7.6E-10	3.1E-06
CHLOROPHENYLMETHYL SULFOXIDE	1.7E+04	0.0E+00	0.0E+00	1.7E+04	0.0E+00	0.0E+00	0.0E+00	1.5E-09	6.0E-06
DIBROMOCHLOROPROPANE	1.4E+00	0.0E+00	0.0E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-04	4.6E-01
DIISOPROPYLMETHYL PHOSPHONATE	6.8E+04	0.0E+00	0.0E+00	6.8E+04	0.0E+00	0.0E+00	0.0E+00	3.5E-10	1.4E-06
ENDRIN	2.5E+02	0.0E+00	0.0E+00	2.5E+02	0.0E+00	0.0E+00	0.0E+00	5.5E-11	2.2E-07
HEXACHLOROCYCLOPENTADIENE	3.8E+02	0.0E+00	0.0E+00	3.8E+02	0.0E+00	0.0E+00	0.0E+00	1.6E-05	6.7E-02
PARATHION	5.1E+03	0.0E+00	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	9.0E-11	3.7E-07
TETRACHLOROETHYLENE	4.1E+01	0.0E+00	0.0E+00	4.1E+01	0.0E+00	0.0E+00	0.0E+00	5.0E-06	2.0E-02
1,1,1-TRICHLOROETHANE	7.8E+04	0.0E+00	0.0E+00	7.8E+04	0.0E+00	0.0E+00	0.0E+00	9.2E-09	3.8E-05
TRICHLOROETHYLENE	1.8E+02	0.0E+00	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	9.8E-06	4.0E-02
MERCURY	4.6E+02	0.0E+00	0.0E+00	4.6E+02	3.3E-04	0.0E+00	3.3E-04	0.0E+00	0.0E+00

3.0 STUDY AREA EXPOSURE SUMMARY

The exposure assessment results for the NCSA at RMA are summarized in Table 3-1. Of the 43 sites that were evaluated, 30 sites were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include:

- Basin A (NCSA-1a)
- Lime Settling Basins (NCSA-1b)
- Drainage Ditch (NCSA-1c)
- Liquid Storage Pool (NCSA-1d)
- Burn Site (NCSA-1e)
- South Plants Drainage Ditches (NCSA-1f)
- Basin C (NCSA-2a)
- Basin D (NCSA-2b)
- Basin E (NCSA-2c)
- Drainage Ditches (NCSA-2d)
- Basin F (NCSA-3)
- Deep Disposal Well (NCSA-4a)
- Basin F Exterior (NCSA-4b)
- Basin B (NCSA-5a)
- Drainage Ditches (NCSA-5b)
- Sand Creek Lateral (NCSA-5c)
- Surface Drainage Canal (NCSA-5d)
- Chemical Sewers from South Plants (NCSA-6a)
- Chemical Sewers from North Plants (NCSA-6b)
- North Bog (NCSA-7)
- Sanitary Sewer Lines (NCSA-8a)
- Domestic Sewer Treatment Plant (NCSA-8b)
- Section 34 - Mercury Detection (NCSA-8c)
- Section 23 - Cadmium Detection (NCSA-9b)
- Section 23 - Cadmium Detection (NCSA-9c)
- Section 23 - Cadmium Detection (NCSA-9d)
- Section 26 - Cadmium Detection (NCSA-9h)

- Section 34 - Arsenic Detection (NCSA-9l)
- Section 35 - Arsenic Detection (NCSA-9o)
- Cadmium Detection (NCSA-9r)

Thirteen sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include:

- Inferred Surficial Contamination (NCSA-1g)
- Section 23 - Diisopropylmethyl Phosphonate Detection (NCSA-9a)
- Section 24 - Zinc Detection (NCSA-9e)
- Section 25 - Zinc and Copper Detections (NCSA-9f)
- Section 26 - Suspected Methylene Chloride Detection (NCSA-9g)
- Section 26 - Butoxyethanol Detection (NCSA-9i)
- Section 26 - Mercury Detection (NCSA-9j)
- Section 26 - Trichloropropene Detection (NCSA-9k)
- Zinc Detection in Bedrock (NCSA-9m)
- Section 35 - Trichloropropene Detection (NCSA-9n)
- Section 36 - Arsenic and Mercury Detections (NCSA-9p)
- Mercury Detection (NCSA-9q)
- Section 36 - Mercury Detection (NCSA-9s)

The COCs in soils (i.e., those displaying an EI greater than 0.1) for the NCSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are:

- Aldrin
- Benzene
- Bicycloheptadiene
- Chlordane
- Chloroacetic acid
- Chlorobenzene
- Chloroform
- Chlorophenylmethyl sulfide
- Chlorophenylmethyl sulfone

- Chlorophenylmethyl sulfoxide
- Dibromochloropropane
- 1,2,-Dichloroethane
- Dicyclopentadiene
- PPDDE
- PPDDT
- Dieldrin
- Dimethyldisulfide
- Endrin
- Fluoroacetic acid
- Hexachlorocyclopentadiene
- Isodrin
- Methylene chloride
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethylene
- Trichloroethylene
- Toluene
- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury

The COSs in groundwater (i.e., those displaying a VEI greater than 1), based on the most sensitive exposed population PPLV (i.e., the industrial worker), are:

- Benzene
- Carbon tetrachloride
- Chlorobenzene
- Chloroform
- Dibromochloropropane
- 1,2-Dichloroethane

- 1,1-Dichloroethylene
- Dicyclopentadiene
- Methylene chloride
- Tetrachloroethylene
- Trichloroethylene

TABLE 3-1
NUMBER OF EXCEEDANCES FOR CONTAMINANTS OF CONCERN
IN THE NORTH CENTRAL STUDY AREA

Contaminant of Concern	Number of Exceedances
Aldrin	19
Benzene	3
Bicycloheptadiene	1
Chlordane	6
Chloroacetic acid	1
Chlorobenzene	1
Chloroform	4
Chlorophenylmethyl sulfide	1
Chlorophenylmethyl sulfone	1
Chlorophenylmethyl sulfoxide	1
Dibromochloropropane	4
1,2-Dichloroethane	1
Dicyclopentadiene	3
PPDDE	4
PPDDT	4
Dieldrin	22
Dimethyldisulfide	1
Endrin	4
Fluoroacetic Acid	8
Hexachlorocyclopentadiene	1
Isodrin	6
Methylene chloride	6
1,1,2,2-Tetrachloroethane	2
Tetrachloroethylene	3
Trichloroethylene	1
Toluene	1
Arsenic	17
Cadmium	15
Chromium	5
Lead	5
Mercury	3

4.0 REFERENCES

RIC 87216R08

EBASCO (Ebasco Services Incorporated). 1987. Final Phase I Contamination Assessment Report. Site 24-6: Sewage Treatment Plant. Version 3.2. July 1987. Task No. 7 - Lower Lakes. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88357R01

EBASCO. 1988a. Proposed Final Rocky Mountain Arsenal Chemical Index Volumes I-II. August 1988. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88076R05

EBASCO. 1988b. Final Phase I Contamination Assessment Report. Site 24-7: North Bog. Version 3.2. March 1988. Task No. 7 - Army Sites South. Task No. 20 - Lower Lakes. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88076R05A

EBASCO. 1988c. Final Phase II Data Addendum. Site 24-7: North Bog. Version 3.1. October 1988. Task No. 20 - Lower Lakes. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88126R06

EBASCO. 1988d. Final Contamination Assessment Report. Sanitary Sewer Interceptor Line. Version 3.2. April 1988. Task No. 10. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88256R03

EBASCO. 1988e. Final Contamination Assessment Report. Sanitary Sewer-Railyard and Administrative Areas. Version 3.2. August 1988. Task No. 10. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87216R08A

EBASCO. 1988f. Final Phase II Data Addendum. Site 24-6: Sewage Treatment Plant. Version 3.1. October 1988. Task No. 20 - Lower Lakes. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC88286R08

EBASCO. 1988g. Final Contamination Assessment Report. Chemical Sewers North Plants and South Plants. Version 3.2. September 1988. Task No. 10. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

EBASCO. 1989a. Final Remedial Investigation Report. Volume XI. North Central Study Area. Version 3.3. July 1989. Contract No. DAAA15-88-D-0024. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88173R02B

EBASCO. 1989b. LTS RMA Final Phase IIb Data Addendum. Site 26-6: Basin F. Version 3.1. January 1989. Task No. 6 - Section 26 and 35. Contract No. DAAK11-84-D-0017. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R07

ESE (Environmental Science and Engineering, Inc.). 1987a. Final Phase I Contamination Assessment Report. Site 36-1: Basin A. Version 3.2. July 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R02

ESE. 1987b. Final Phase I Contamination Assessment Report. Site 36-4: Lime Settling Basins. Version 3.3. June 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87113R01

ESE. 1987c. Final Phase I Contamination Assessment Report. Site 36-8: Chemical Drainage Ditch. Version 3.2. April 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87133R01

ESE. 1987d. Final Phase I Contamination Assessment Report. Site 36-11: Liquid Storage Pool. Version 3.2. May 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R03

ESE. 1987e. Final Phase I Contamination Assessment Report. Site 36-15: Burning Site. Version 3.2. July 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87133R03

ESE. 1987f. Final Phase I Contamination Assessment Report. Site 36-21: Drainage Ditch. Version 3.2. April 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87343R03

ESE. 1987g. Final Phase I Contamination Assessment Report. Site 26-3: Basin C. Version 3.3. December 1987. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87293R01

ESE. 1987h. Final Phase I Contamination Assessment Report. Site 26-4: Basin D. Version 3.3. October 1987. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R04

ESE. 1987i. Final Phase I Contamination Assessment Report. Site 26-5: Basin E. Version 3.2. July 1987. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87293R02

ESE. 1987j. Final Phase I Contamination Assessment Report. Section 26 - Uncontaminated. Version 3.3. September 1987. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R05

ESE. 1987k. Final Phase I Contamination Assessment Report. Site 35-3: Basin B. Version 3.3. July 1987. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R06

ESE. 1987l. Final Phase I Contamination Assessment Report. Site 35-4/26-7: Basins A, B, and C Drainage Ditches. Version 3.2. July 1987. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87313R01

ESE. 1987m. Final Phase I Contamination Assessment Report. Section 35 - Uncontaminated. Version 3.3. November 1987. Task No. 6 - Sections 26 and 35. September 1988. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87133R02

ESE. 1987n. Final Phase I Contamination Assessment Report. Site 36-20: Chemical Sewer. Version 3.2. April 1987. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88013R02

ESE 1987o. Final Phase I Contamination Assessment Report. Section 27: Nonsource Area. Version 3.1. December 1987. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R07A

ESE. 1988a. Final Phase II Data Addendum. Site 36-1: Basin A. Version 3.1. September 1988. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R02A

ESE. 1988b. Phase II Data Addendum. Site 36-4: Lime Settling Basins. Version 3.1. September 1988. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87113R01A

ESE. 1988c. Final Phase II Data Addendum. Site 36-8: Chemical Drainage Ditch. Version 3.1. August 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87133R01A

ESE. 1988d. Final Phase II Data Addendum. Site 36-11: Liquid Storage Tank. Version 3.1. August 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R03A

ESE. 1988e. Final Phase II Data Addendum. Site 36-15: Burning Site. Version 3.1. August 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88063R07

ESE. 1988f. Final Phase I Contamination Assessment Report. Site 36-7: Solid Waste Burial/Sanitary Pit. Mercury Spill. Version 3.3. January 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88033R02

ESE. 1988g. Final Phase I Contamination Assessment Report. Site 36-10: Pit. Version 3.2. January 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88103R01

ESE. 1988h. Final Phase I Contamination Assessment Report. Site 36-22: Liquid Storage Pool. Version 3.2. March 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87343R03A

ESE. 1988i. Final Phase II Data Addendum. Site 26-3: Basin C. Version 3.1. September 1988. Task No. 6 - Section 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87293R01A

ESE. 1988j. Final Phase II Data Addendum. Site 26-4: Basin D. Version 3.1. September 1988. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R04A

ESE. 1988k. Final Phase II Data Addendum. Site 26-5: Basin E. Version 3.1. September 1988. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88173R02

ESE. 1988l. Final Phase I Contamination Assessment Report. Site 26-6: Basin F. Version 3.3. May 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88103R02

ESE. 1988m. Final Phase I Contamination Assessment Report. Site 26-1: Deep Disposal Well and Chemical Sewers. Version 3.2. March 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88103R02A

ESE. 1988n. Final Phase II Data Addendum. Site 26-1: Deep Disposal Well and Chemical Sewers. Version 3.2. August 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88173R02A

ESE. 1988o. Final Phase II Data Addendum. Site 26-6: Basin F Exterior. Version 3.1. September 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88243R02

ESE. 1988p. Final Phase I Contamination Assessment Report. Section 23 - Nonsource Area. Version 3.3. August 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87293R02A

ESE. 1988q. Final Phase II Data Addendum. Section 26 - Nonsource Area. Version 3.1. August 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R05A

ESE. 1988r. Final Phase II Data Addendum. Site 35-3: Basin B. Version 3.1. September 1988. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87203R06A

ESE. 1988s. Final Phase II Data Addendum. Site 35-4/26-7: Basin A, B, and C Drainage Ditches. Version 3.1. September 1988. Task No. 6/19 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87313R01A

ESE. 1988t. Final Phase III Data Addendum. Section 35 - Nonsource Area. Version 3.1. September 1988. Task No. 6 - Sections 26 and 35. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88133R02

ESE. 1988u. Final Phase I Contamination Assessment Report. Site 35-2/26-9: Chemical Sewer. Version 3.1. May 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 87133R02A

ESE. 1988v. Final Phase II Data Addendum. Site 36-20: Chemical Sewer. Version 3.1. August 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88203R04

ESE. 1988w. Final Phase I Contamination Assessment Report. Section 34 - Nonsource Area. Version 3.2. July 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88203R03

ESE. 1988x. Final Phase I Contamination Assessment Report. Section 24 - Nonsource Area. Version 3.2. June 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88063R09

ESE. 1988y. Final Phase I Contamination Assessment Report. Section 25 - Nonsource Area. Version 3.2. March 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88063R09A

ESE. 1988z. Final Phase II Data Addendum. Section 25 - Nonsource Area. Version 3.1. September 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88293R04

ESE. 1988aa. Final Phase I Contamination Assessment Report. Site 35-6: Possible Munitions Test Area. Version 3.2. July 1988. Task No. 14 - Army Sites North. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

RIC 88063R07A

ESE. 1988bb. Final Phase II Data Addendum. Site 36-7: Solid Waste Burial/Sanitary Pit. Version 3.1. August 1988. Contract No. DAAK11-84-D-0016. Prepared for: U.S. Army Program Manager's Office for Contamination Cleanup.

RIC 88063R01

ESE. 1988cc. Final Phase I Contamination Assessment Report. Site 36-5: Mercury Spill. Version 3.3. January 1988. Task No. 1 - Section 36. Contract No. DAAK11-84-D0016. Prepared for: U.S. Army Program Manager's Office for RMA Contamination Cleanup.

APPENDIX A
NONTARGET SCREENING

A-1

NONTARGET SCREENING

A number of nontarget contaminants were originally identified through a screen (i.e., toxicity, concentration, frequency of occurrence) of the nontarget fraction of the Phases I and II RI data as part of the RMA Chemical Index (EBASCO, 1988a/RIC88387R01). These contaminants were carried through to the exposure assessment where an additional screening was performed to determine whether PPLVs should be developed for each of the site-specific nontarget contaminants. Development of PPLVs for these contaminants was based on four screening criteria, namely, frequency of occurrence, similarity of the nontarget concentration to that of target contaminants, suspicion that the detection was a laboratory contaminant, and co-occurrence of nontargets with targets in Arsenal soils (see Volume VI-A, Section 2.2.3.1).

The results of the nontarget evaluations for each site of North Central Study Area, their screening parameters, and the decision to further consider or reject them, are presented in Table A-1.

TABLE A-1
NORTH CENTRAL NONTARGET SCREENING

Site	Nontarget Contaminant	Frequency of Occurrence	Relative Concentration	Suspected Lab Contam.	Co-occurs with Drivers	Nontarget Decision
NCSA-1A	Methyl cyclohexane	Low	Low	No	Yes	Reject
	Hexachlorobutadiene	Low	Low	No	Yes	Reject
	Oxybisethanol	Low	Low	No	Yes	Reject
	Phosphoric acid, triphenyl ester	Low	Low	No	Yes	Reject
	Tetrachlorobenzene	Low	Low	No	Yes	Reject
NCSA-1B	2-Butoxyethanol	Low	Low	No	Yes	Reject
	Flouranthene	Low	Moderate	No	Yes	Reject
	Hexachlorobutadiene	Low	Low	No	Yes	Reject
	Methyl naphthalene	Low	Low	No	Yes	Reject
	Methyl phosphonic acid	Low	High	No	Yes	Reject
	Oxybisethanol	Low	Low	No	Yes	Reject
	Phosphoric acid, triphenyl ester	Moderate	Low	No	Yes	Reject
	Pyrene	Moderate	Moderate	No	Yes	Reject
NCSA-1C	Methyl phosphonic acid	Low	Moderate	No	Yes	Reject
NCSA-1E	Tetrachlorobenzene	Low	Low	No	Yes	Reject
	Methyl phosphonic acid	Low	Moderate	No	Yes	Reject
NCSA-1F	Methyl phosphonic acid	Low	Moderate	No	Yes	Reject
	Pentachlorobenzene	Low	Low	No	Yes	Reject
NCSA-2A	Methyl phosphonic acid	Low	High	No	Yes	Reject

TABLE A-1 (Continued)
NORTH CENTRAL NONTARGET SCREENING

Site	Nontarget Contaminant	Frequency of Occurrence	Relative Concentration	Suspected Lab Contam.	Co-occurs with Drivers	Nontarget Decision
NCSA-2B	Methyl phosphonic acid	Low	Low	No	Yes	Reject
NCSA-2C	Oxybisethanol	Low	Low	No	Yes	Reject
	Phosphoric acid, triphenyl ester	Low	Low	No	Yes	Reject
NCSA-3	Hexachlorobutadiene	Low	Low	No	Yes	Reject
	Oxybisethanol	Low	Low	No	Yes	Reject
	Tetrachlorobenzene	Low	Low	No	Yes	Reject
	1,1,2,2-Tetrachloroethane	Low	Low	No	Yes	Reject ^{1/}
NCSA-4A	Phosphoric acid, triphenyl ester	Low	Low	No	Yes	Reject
	Pyrene	Low	Low	No	Yes	Reject
NCSA-5B	Oxybisethanol	Low	Low	No	Yes	Reject
	1,1,2,2-Tetrachloroethane	Low	Low	No	Yes	Reject ^{1/}
NCSA-6A	Tetrachlorobenzene	Low	Low	No	Yes	Reject
NCSA-6B	Oxybisethanol	Low	Low	No	Yes	Reject
	Trichloropropene	Low	Low	No	Yes	Reject
NCSA-9I	2-Butoxyethanol	Low	Low	No	No	Reject

TABLE A-1 (Continued)
NORTH CENTRAL NONTARGET SCREENING

Site	Nontarget Contaminant	Frequency of Occurrence	Relative Concentration	Suspected Lab Contam.	Co-occurs with Drivers	Nontarget Decision
NCSA-9K	Trichloropropene	Low	Low	No	No	Reject
NCSA-9N	Trichloropropene	Low	Low	No	No	Reject

1/ Although rejected, PPLVS are computed for this chemical since it was detected in the North Central Study Area.

APPENDIX B
NORTH CENTRAL STUDY AREA

Appendix B

North Central Study Area

Two sites in this study area had exceedances of the open space vapor inhalation pathway: NCSA-1b and NCSA-3. According to the methodology presented in Volume IV, Section 4.5.8, the representative exposure index (EI_{REP}) was calculated using the mean soil contaminant concentration at the site for the specific contaminant(s) in question.

The mean soil contaminant concentrations were calculated as the geometric mean of the hits for contaminants with less than 30 percent hits and the adjusted geometric mean of the hits for contaminants with greater than 30 percent hits. This procedure was adopted to ensure the most conservative computation of the mean values.

The EI_{REP} was then calculated using the lowest open space SPPPLV calculated for a particular contaminant at the site. The open space SPPPLVs used were either recreational (Rec) and industrial (Ind). EI_{REP} 's with values greater than 0.1 are exceedances and are designated with an asterisk. The sites, contaminants, SPPPLVs, mean concentrations, and EI_{REP} 's are listed in Table B-1.

There were no EI_{REP} exceedances for this study area.

TABLE B-1
NORTH CENTRAL STUDY AREA EI_{RBP} 's

Site	Contaminant	SPPPLV (ug/kg)	Mean Concentrations (ug/kg)	EI_{RBP}
NCSA-1b	Aldrin	4,500 Rec ^{1/}	3.33	7.2×10^{-4}
NCSA-3	DCPD	38,00 Rec	93	2.4×10^{-3}

1/ Rec denotes that the recreational visitor SPPPLV was used to calculate EI_{RBP} .